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ABSTRACT

Fifty vocational educators, including directors of Research Coordinating Units, participated in a 1-week institute designed to identify ways to revitalize vocational education in metropolitan areas. The participants heard and reacted to presentations by five nationally recognized individuals which emphasized change process and educational innovation. Participants also met in small groups to develop models and guidelines useful in implementing change in their home states. On the last day a posttest was administered which indicated participants were generally well pleased with the presentations and overall operation. Also, evidence indicated that a majority of participants had implemented planned program changes as a result of having attended the institute. The five major presentations are available in VT 014 112 in this issue. (Author/JS)

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FINAL REPORT

Institute IX

Project No. 9-0524
Grant No. OEG-0-9-150524-4520 (725)

WESTERN METROPOLITAN AREA APPLICATION OF VOCATIONAL EDUCATION INNOVATIONS RESULTING FROM RESEARCH AND DEVELOPMENT PROGRAMS

Volume I

Part of
Short Term Institutes for Inservice Training of
Professional Personnel Responsible for Vocational-Technical Education in Western Metropolitan Areas

Ivan E. Valentine

Nelson W. Lowery

Albuquerque Technical Vocational Institute
Albuquerque, New Mexico

In cooperation with
Colorado State University
Fort Collins, Colorado

June, 1971

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Office of Education
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Final Report
Institute IX
Grant No. OEG-0-9-150524-4520 (725)

Metropolitan Area Application of Vocational Education Innovations Resulting from Research and Development Programs

Part of
Short Term Institutes for Inservice Training of Professional Personnel Responsible for Vocational-Technical Education in Western Metropolitan Areas

Ivan E. Valentine
Project Director

Nelson W. Lowery
Project Co-Director

Albuquerque Technical-Vocational Institute

in cooperation with
Colorado State University
Department of Vocational Education

September 1970

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U.S. DEPARTMENT OF
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In addition special recognition is given to Ardith Jameson, Marilyn Barnard and Arthur L. Tibbs, Research Associates, for their efforts in data collection, analysis and assistance with the final report.

Ivan E. Valentine
Institute Director

SUMMARY

GRANT NO.: OEG-0-9-150524-4520 (725)

TITLE: Metropolitan Area Application of Vocational Education Innovations Resulting from Research and Development Programs

PROJECT DIRECTOR: Dr. Ivan E. Valentine
Department of Vocational Education
Colorado State University
Fort Collins, Colorado

INSTITUTION: Albuquerque Technical-Vocational Institute

in cooperation with Colorado State University
Department of Vocational Education

INSTITUTE DATES: September 14, 1970 to September 18, 1970

Problem, Purposes and Objectives

An abiding concern in vocational education is how to improve the image of vocational education in metropolitan area schools. Recent literature in education has pointed out the fact that a large gap presently exists between research and practical application of the results.

Changes in vocational programs traditionally have not resulted from research and development activities designed to improve local vocational education programs. Modern means of collection, storage, dissemination of the findings of research and development activities hold great promise for application of research results. Not all research and development activities result in positive action in the change process. The knowledge explosion and the modern technology (computers) give the educator a resource that has not been fully utilized in planning, developing, and evaluating local programs of vocational education. The greatest deterrent factor in implementing planned change is the diffusion of relevant information to those key individuals who are in a position to make change. One of the greatest challenges in this institute is to provoke on part of the participants and consultants a common understanding of mutual problems, and to develop several techniques whereby the results of research and development can be refined and simplified for application by classroom teachers.

The central purpose of this institute is to evaluate the results of research and development activities which are designed to accelerate the adoption and application of innovations in vocational education for metropolitan areas. Concurrently, the results will provide those individuals with present state and local administrative responsibilities with the fundamental, theoretical and philosophical concepts coupled with

basic principles for effective program development and operation essential to expanding vocational education in metropolitan areas. The institute is organized to provide a research base relative to identifying innovations and the change process as it relates to revitalizing vocational education in metropolitan areas.

To accomplish these purposes specific objectives were established as follows:

1. To examine and categorize the information services educators need in order to use research and other technical information in planning, implementing, and evaluating vocational education programs.

2. To assess the major active or planned information systems or services relevant to vocational education.

3. To identify gaps in present systems for acquiring, processing, announcing, disseminating, analyzing, and interpreting education report literature; particularly for documents generated by state and local educational agencies.

4. To develop alternative models for organizing needed services with potential for high cost benefited returns, specifying information service roles, functions, and activities at local, intermediate, state and multi-state levels.

5. To test models using simulations and other appropriate data.

Procedures and Activities

The institutes content and agenda are categorized into three major phases, pre-institute activities, institute activities and post-institute activities.

The pre-institute activities consisted of a planning committee which met for two days in January of 1970 for the purpose of planning the institute relative to refining:

1. Objectives of the Institute

2. Participant Selection

3. Consultant and institute staff responsibilities

Individuals with national recognized expertise on selected subjects prepared papers on five topics which were sent to reactors and participants in advance of the institute. The reactors prepared written reviews of the papers.

To accomplish the purposes and activities established, a variety of activities were used during the one-week institute. One of the five major topics was introduced each day. Two reactors who had reviewed and

criticized the paper in advance made an oral presentation on the topic to set the stage for small group working sessions. Participants were assigned to small working groups to carry on predetermined expected achievements (developing models, guidelines and so forth).

A post-test was administered on the last day of the institute which was designed to elicit data relative to the institute and its effectiveness. Six months after the institute, a follow-up instrument was administered to participants to assess the vocational education program changes made or planned that resulted from participants having attended the institute.

Participants selected were from State Research Coordinating Units, directors of research in city school systems, state directors and assistant state directors of vocational education and curriculum coordinators or developers. Eighteen states were represented by the 50 participants who had varied responsibilities and experiences which added to the value and enrichment of the institute.

Conclusions and Recommendations

As a result of the work done by the participants the following conclusions were developed:

1. The geographical mix of the participants promoted valuable exchange of information about innovations resulting from research and development programs.

2. Selection of participants provided cross-sectional variety of service areas, institutional classifications, and professional position classifications.

3. Evaluation results indicated that participants were generally well pleased with the presentations and overall operation of the institute.

4. The evidence indicated that a majority of participants had re-evaluated their programs and had implemented or planned to implement positive program change as a result of having attended the institute.

5. All of the participants felt they had explored and learned new ideas and concepts that related to actual practice in programming vocational offerings in metropolitan areas.

The following recommendations are offered based on the experience of the institute and on the evaluation instruments:

1. Institutions should be encouraged to sponsor institutes providing for continuation of training in the application of vocational education innovations resulting from research and development programs.

2. At future institutes, every effort should be made to attract participants from new and developing institutions and programs.

3. Preparation and dissemination of printed material related to practical situations that can be used immediately by the participants should be continued and improved.

4. A study should be conducted to determine the need for training vocational educators in research and development techniques.

5. Time for individual and group participation in the program should be continued.

Results:

According to the evaluation devices employed during and following the institute the objectives which were established were apparently achieved, thus indicating a successful institute. The majority of the participants responded to the institute by utilizing the information and ideas presented; therefore, demonstrating the timeliness and relevance of the institute to the individual attending.

INTRODUCTION

The Problem

Both the Vocational Education Act of 1963 and the Vocational Education Amendments of 1968 provide for, and in fact require, evaluation of vocational education programs. The Declaration of Purpose states in part that funds are authorized to . . . "improve existing programs of vocational education" . . . and that persons of all ages . . . "will have ready access to vocational training or retraining which is of high quality". . . .

Before existing programs can be "improved" and before access to programs of "high quality" can be insured, adequate systems and techniques of evaluation must be developed and put into operation. The use of quick and often highly subjective devices for appraising the quantity and quality of vocational programs will not suffice. Professional educators are recognizing the importance and complexity of the evaluation process but have not yet taken the necessary steps to fully develop and operationalize an effective evaluation program.

The infant status of evaluation may in part account for the many common shortcomings of past evaluation efforts.

1. Most evaluative efforts have failed to provide valid and reliable information needed to support sound decision-making because of the following:
   a. Reports often contain only impressionistic information
   b. Many reports are almost devoid of hard data
   c. An over-reliance on anecdotal comments
   d. An over-reliance on subjective determinations

2. Evaluations have focused almost entirely on the educational process-curricular organization, staff activities and qualifications, and physical facilities while ignoring program outcomes. Process evaluations by themselves cannot gauge program effectiveness.

3. Evaluations have too often been an afterthought, partial and sporadic rather than planned, thorough and continuous.

Unfortunately, the status of evaluation in both vocational and general education today can be summarized as follows:

1. There is a lack of adequate theory pertaining to the nature of evaluations which are needed to effectively accommodate educational programs.

2. There is a lack of knowledge about decision-making processes and information requirements.

3. There is a lack of appropriate evaluation instruments and procedures for gathering data.

4. There is a lack of mechanisms for organizing, processing, and reporting evaluative information.

5. There is a critical shortage of trained evaluators.

It was an awareness of the problems facing those who must evaluate and recognition of the important contribution that well-designed evaluations can make to improving vocational education programs that supported the need for conducting this institute.

Purposes of the Institute

The central purpose of this institute was to evaluate the results of research and development activities which are designed to accelerate the adoption and application of innovations in vocational education for metropolitan areas. Concurrently the results have provided those individuals with present state and local administrative responsibilities with the fundamental theoretical and philosophical concepts coupled with basic principles for effective program development and operation essential to expanding vocational education in metropolitan areas. The institute was organized to provide a research base relative to identifying innovations and the change process as it related to revitalizing vocational education in metropolitan areas.

An abiding concern in vocational education is how to improve the image of vocational education in metropolitan area schools. Recent literature in education has pointed out the fact that a large gap presently exists between research and practical application of the results.

Changes in vocational programs traditionally have not resulted from research and development activities designed to improve local vocational education programs. Modern means of collection, storage, and dissemination of the findings of research and development activities hold great promise for application of research results. Not all research and development activities result in positive action in the change process. The knowledge explosion and the modern technology (computer) give the educator a resource that has not been fully utilized in planning, developing, and evaluating local programs of vocational education. The greatest deterrent factor in implementing planned change, is the diffusion of relevant information to those key individuals who are in a position to make change. One of the greatest challenges in this institute was to provoke on part of the participants and consultants a common understanding of mutual problems, and to develop several techniques whereby the results of research and development can be refined and simplified for application by classroom teachers.

A review of present information systems, ERIC and others, to assess their impact for contributing to the change process leaves much to be desired. A major responsibility for vocational education in metropolitan

areas is to determine what is valid and reliable information. Educators must devise a means to manipulate and segregate this mass of data into meaningful models or processes to stimulate changes based on democratic decisions designed specifically to improve the instruction program.

A major gap in disseminating information is directly related to the development of effective techniques and procedures for identifying what structural linkages exist between the decision-maker, and those responsible for implementing decisions, and to explore in depth the specific communication blocks that restrict the flow of information within an organization.

The data available from present systems or models PPBS--PERT may be viewed as being systems research; however, much needs to be accomplished in vocational education to close the gap between expectations and achievement in the application of these systems. A study of several models (Manpower - evaluation, program planning) was presented and reviewed with the intent of redesigning in terms of applications, or stipulating how they can be manipulated for application relative to improving the utilization of the systems approach in a most fertile and valid way.

A portion of this institute was directed to fostering the fertility of imagination to create models or other devices to enable school administrators to redirect community resources to strengthen the vocational education program. Further probing into exemplary and demonstration projects was integrated and studied for the feasibility of application to meet the metropolitan area needs. Models generated from the institute and those from other resources were tested for applicability in fostering a speed up between the completed research and the implementation of findings. Very little is known about the process of how the results of research or new ideas move through the structure in the educational system.

It was to this end that the institute was directed--the implementation of positive change for vocational education in the metropolitan areas. Ultimately, the institute provided vocational educators and other researchers with specific information relative to the applications of techniques for reducing the lag time between research and program implementation.

Objectives of the Institute

The specific objectives established for the institute were as follows:

1. To examine and categorize the information services educators need in order to use research and other technical information in planning, implementing and evaluating vocational education programs.

2. To assess the major active or planned information systems or services relevant to vocational education.

3. To identify gaps in present systems for acquiring, processing, announcing, disseminating, analyzing and interpreting education report literature. Particularly for documents generated by state and local educational agencies.

4. To develop alternate models for organizing needed services with potential for high cost benefited returns, specifying information service roles, functions, and activities at local, intermediate, state, and multi-state levels.

5. To test models using simulations and other appropriate data.

Contributions to Vocational Education

Ultimately the institute provided information and techniques relevant to devising strategies to facilitate the acceptance and expansion of vocational education in metropolitan areas. The institute made a further contribution to education by providing the models to a local school system desiring to become more effective in permeating information about vocational education throughout their organization.

Institute Report

The final report on the institute has been prepared in two parts; (1) Volume I, which includes all information relative to the institute except the text of the papers of the five major topics presented and (2) Volume II, an instructional materials supplement that includes the complete text of the five topicspresented.

METHODS AND PROCEDURES

The institute content and agenda are included below and are categorized into three major phases, pre-institute activities, institute activities, and post-institute activities.

Pre-Institute Activities

1. Planning Committee (2-days)

   A meeting was held in January of 1970 for the purpose of planning the institute relative to refining:
   a. objectives of the institute
   b. participant selection
   c. consultant and institute staff responsibilities.
   The meeting was planned to be held in Albuquerque, New Mexico. The arrangements for facilities required for conducting the institute were coordinated with the sponsoring agency at this meeting.

2. Instructional material preparation

   Individuals with nationally recognized expertise on the selected subjects prepared papers which set the stage for participant working sessions. The objectives of this technique were to develop skills and competencies on the part of the participants to develop an understanding whereby they could contribute to the overall development of models, systems, and other special instrumentation for testing models and provide the participants with skills in developing and testing simulation material as a result of attending the institute.

Institute Operation

1. The five papers were prepared in advance and sent to reactors who presented written reviews of the papers during the institute. Two or three qualified reactors reviewed and critiqued the prepared papers in advance, then made oral presentations and set the stage for small group working sessions.

2. The participants selected to attend the institute received copies of the consultant's prepared papers in advance (2 weeks) and were instructed in the techniques to be utilized in the operation of the institute prior to attending the institute.

3. The institute began on a Sunday, which was utilized in registering participants and completing the necessary administrative details. Part of the Monday morning session was also used for this purpose.

4. A meeting of consultants, reactors, discussion leaders, recorders

and institute staff members was held to discuss the week's activities during the administration and registration of participants.

5. Participants were assigned to small working groups prior to attending the institute. The institute staff selected a discussion leader for each group in advance.

6. The first reactor panel was presented at a Monday luncheon (45-60 minutes), then participants were broken into their smaller working groups for carrying on predetermined expected achievements (developing models - guidelines and so forth). These small groups met together Monday afternoon and Tuesday a.m. Each discussion leader appointed a recorder who was responsible for recording and reporting that group's activities and the material developed therein.

7. A new topic was introduced at the noon luncheon each day and the same method of operation prevailed throughout the week for the period of the institute. Facilities were made available to participants at all times in the event that they wished to work on specific topics during the evening hours.

Staff, Consultants and Participants

A total of 50 participants were selected from state RCU directors, directors of research in city school systems, state directors and assistant state directors of vocational education and curriculum coordinators. Plans called for the selection of 25 superintendents, or assistant superintendents, or state department personnel, 15 RCU directors, and 10 classified in curriculum or coordination. A complete list of institute staff, consultants and participants is included in Appendix A.

Agenda

A complete agenda for the six days of the institute, September 13 through September 18, 1970 is included in Appendix B.

Facilities

Facilities required for this institute were one large meeting room for 60 people and 3 small meeting rooms for approximately 15 to 20 persons each. Typewriters and secretarial space were required. Facilities were also required for lodging and board for participants and institute staff. A facility was required to handle a noon luncheon Monday through Friday and also must provide facilities (audio-visual, etc.) for the reactor's contribution to the scheduled program.

Evaluation

A major topic was discussed on each of the five days of the institute. Participants were asked to evaluate each topic at completion of the group discussions for each major topic by means of a one-page (five item)

evaluation sheet. These sheets were color coded for each day as the same criteria was used for each topic. Copies of the evaluation sheets are included in Appendix C.

A questionnaire was developed to determine the institute participants attitude or feelings concerning Vocational Education. This instrument was administered to all participants on the first day of the institute. A copy of the instrument is included in Appendix D.

An inventory (participant self-appraisal) in the form of a post-test was administered on the last day of the institute. The inventory was designed to elicit from participants data relative to the institute and its effectiveness for accomplishing stated objectives. Concurrently, it measured participant attitude about new concepts gained as a direct result of attending the institute. A copy of the post-test is included in Appendix E.

A post-institute follow-up instrument was developed and administered to all participants six months after the institute to assess the vocational education program changes made or planned that resulted from participants having attended the institute. A copy of the instrument is included in Appendix F.

Institute Personnel

Project Director---Ivan E. Valentine---Dr. Valentine received his B.S. at South Dakota State University, the M.E. from Colorado State University and a Ph.D. at The Ohio State University, Columbus, Ohio. He has had eight years as a local director of vocational education, served as president of a Technical Institute, three years as a state coordinator of area schools in North Carolina, three years as assistant director for State Department of Community Colleges, North Carolina. Dr. Valentine served three years as consultant and research associate at The National Center for Vocational and Technical Education, The Ohio State University. Present duties at Colorado State University include research activities, teaching research, statistics, administration and supervision classes. The areas of research include, leadership development training, student perception studies, developing simulation materials for leadership training, and facility planning for vocational-technical education. Experience also includes coordinating eleven National Leadership Development Institutes in Technical Education sponsored by the USOE and conducted by The National Center for Vocational and Technical Education. Dr. Valentine has written extensively, among his publications are included articles relative to data processing, facility planning, leadership and master planning.

Project Co-Director---Nelson W. Lowery---Mr. Lowery received his B.S. from Oklahoma Panhandle State and his M.A. from the University of New Mexico. Mr. Lowery taught one year in the Oklahoma public schools, nine years in New Mexico public schools and has served as the Director of Vocational Education in Albuquerque public schools for the past twelve years. A large portion of his activities have included planning and developing the Albuquerque Vocational-Technical Institute. Mr. Lowery

has written several articles relative to planning and developing vocational education programs in New Mexico, and presently is interested in developing vocational education programs at the junior high level--this activity will have national implications.

Major Papers Presented and Authors

1. "An Assessment Of Present Information Systems And Implications For Vocational Education."--- This paper outlined a technique and proposed a model for utilization of existing information (data, research results) as a vehicle to be woven into the change process for vocational education in metropolitan areas.
   Dr. Douglas C. Towne
   Tennessee Research Coordinating Unit
   University of Tennessee
   Memphis, Tennessee

2. "Systems Analysis As An Instrument For Change In Urban Education."--- This paper explored the application of the various existing systems (PPBS) and others in implementing a systems approach.
   David S. Bushnell
   Battelle Institute
   Washington, D. C.

3. "Long-Range Planning In Vocational-Technical Education."--- This paper outlined techniques and devised strategies to facilitate new ideas and concepts as a result of master planning. The long-range planning technique will provide educational leaders with procedures and guidelines for bringing about positive program change in vocational education in metropolitan areas. Included in this paper was the establishment of alternatives and priorities that are an essential part of long-range program planning.
   Joseph F. Malinski
   Program Development Section
   Vocational-Technical Education
   Minnesota Department of Education
   St. Paul, Minnesota

4. "An Overview For The Application Of Community Resources Relative To Specific Educational Needs."--- A model or guide resulting from the institutes was meant to set the stage for reviewing community rationale for allocation and commitment of resources, (facilities, equipment, staff, money) relative to the needs of all students. Criteria were developed for establishing guidelines relative to what procedures should be taken to gain the greatest returns from community investments in special programs (vocational education, disadvantaged, etc.) to insure maximum utilization of limited resources.
   A. P. Garbin
   University of Georgia
   Athens, Georgia

5. "Using The Delphi Technique And Simulation Exercises In Implementing Planned Program Change In Vocational Education." The objective of this presentation was to develop a model or models of aforementioned topics to be tested at local, state, or regional levels. The numbers of models developed were determined by the nature and depth of each subject treated by each specific author of the assigned paper.

Dr. Donald Anderson
School of Education
The Ohio State University
Columbus, Ohio

Reactors and Reaction Papers

The next portions of this section includes reaction papers, prepared by the institute consultants, on each of the major presentations. These reaction papers are a review and critique of the papers on the five major topics presented at the institute. A complete text of the topic papers from which the reaction papers were prepared are included in Volume II of the final report. Results of small group discussions of the topics follow the reaction papers in the form of flow charts and models.

GENERAL OVER-ALL OBJECTIVES

OF

INSTITUTE IX

- To develop a model and guidelines resulting from research for redirecting community resources to meet educational needs of all students served within the district.

- To review present resource allocations and operating structures in terms of available resources based on realistic educational additional program requirements.

- To review the results of research and development activities and to determine the application and findings in terms of educational programs relative to change and redirection.

- To develop guidelines for reallocating community resources and provide the individual with a program that will be relevant in terms of self-satisfaction in preparing for the world of work.

SUMMARY OF PROCEEDINGS

SESSION I - INSTITUTE IX

INSTITUTE IX
I SESSION

AN ASSESSMENT OF PRESENT INFORMATION SYSTEMS
AND IMPLICATIONS FOR VOCATIONAL EDUCATION

1. Examine and catagorize the information services the educator needs in order to use research and other technical information in planning, implementing, and evaluating Vocational Education Programs;

2. Assess the major active or planned information systems or services relevant to Vocational Education;

3. Identify gaps in present systems for acquiring, processing, announcing, disseminating, analyzing, and interpreting education report literature. Particularly for documents generated by state and local educational agencies;

4. Develop alternate models for organizing needed services with potential for high cost benefited returns, specifying information services roles, functions, and activities at local, intermediate, state and multi-state levels;

5. Test models using simulation and other appropriate data.

A Reaction Paper to
AN ASSESSMENT OF PRESENT INFORMATION SYSTEMS
AND IMPLICATIONS FOR VOCATIONAL EDUCATION
By Douglas C. Towne

Prepared By

Dr. Dale Sparks

The author's main thesis is that change and information systems are strongly linked. He argues that change is necessary, not just replacement, in improving the education of the Vocational-Technical student. I agree. However, a couple of very key points are not clear from reading Professor Towne's paper. The author's number one assumption seems to be that everyone welcomes information and that is unfortunately not true. Ready sources of information represent substantial threats to many educators and researchers in that these sources of information challenge the expertise of these same teachers and researchers. Information systems force a degree of comparison never before possible in that the availability of vast information sources now make it possible to analytically compare the results of different teaching methods.

A change is often brought about by assuming certain events to be true and then implementing some system to test those assumptions. Seldom do we find people with enough courage to admit their pet theory did not hold water. I think the present lack of success of information systems suggests perhaps some courage is needed in assessing the value of these systems. The author's point about information systems being self-serving is well taken as is his point that we tend to communicate within our own interest groups. Probably the greatest users of information systems are the people who work in information systems.

The author seems to minimize in some instances the problems one is likely to encounter in being innovative. For example on page 14 he says: "Could we not easily effect some major changes in our programs by changing materials utilized by our teachers?"

No! Major changes are never accomplished easily unless the whole system is vacuous. Change is accomplished by individuals who are convinced of the desirability of the change. Everybody gets accustomed to performing their work in a manner in which they feel comfortable. If the goal of the institution is as the author hopes, the improvement in the students knowledge and ability, then I submit some motivation must be provided the teacher as well as the student. I believe some system must be adopted to reward the teachers for their efforts in trying to use information systems and hopefully upgrade their teaching efforts. Using information systems

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*Dr. Sparks is Assistant Professor, Electrical Engineering Department, University of New Mexico.

is hard work. Many people resist these systems because more work is imposed and unless higher rewards are offered it is not realistic to expect wide acceptance of these systems. In a word; pride in a better school and community and monetary rewards may be appropriate.

Mr. Towne had done a good job in his paper of provoking some thought. He does, however, mislead somewhat on a couple of points. One of these is the teachers use of ERIC. ERIC is not structured at all for SDI.

The Director of data processing on the ERIC system is a realist named Harvey Marron. The contention of Mr. Towne is that ERIC should do S.D.I. sort of information processing thus serving individuals in teaching and research. Marron is realistic about what ERIC can accomplish. He is I am sure under constant pressure to expand ERIC's function and purpose. Marron certainly knows how difficult the job of imputing information into the ERIC system is and particularly how difficult the abstracting on key words has become.

True, ERIC is concerned about input but they have accomplished a great deal in their printed abstract service and document dissemination on micro fiche. I believe anyone who is motivated to the point where he really wants the abstract service of ERIC will find the system is not untenable. The author approaches the problem from a rather pure stance where such details as cost of the service rendered is not of immediate concern. Unfortunately, information systems are constantly under cost evaluation and cost is a major factor in their acceptance. The ARAC system, for example, at the University of Indiana works under the following three criteria:

1. Minimum operating cost per question or profile;
2. Ease of use by personnel unfamiliar with data processing, information retrieval and computers; and
3. Flexible and reliable systems which will have high tolerance for data and common equipment errors

In expanding on the first of these the system designers state the following about ARAC:

"ARAC functions under business standards and must be in the position to justify and 'sell' its products. Information is, typically, difficult to price as to value."

The author's development of the several models presented in the paper I find quite good. I particularly agree that the Research Development and diffusion model appeals to the logical person. I also believe this is a reasonable representation of how systems function today.

There is one aspect of Professor Towne's development of his several models which I find somewhat confusing. The use of the words information system imply so many possible things that I am never quite sure just which aspect I should be considering. I believe a comment from a proposal by Allen J. Perlis of Carnegie is appropriate about information processing.

"Any attempt to define the field of information processing (called by this or any other name) by its inherent subject matter encounters difficulties. Clearly, the field is concerned with information, the systems that process and transform it, and the way it is used to control, integrate and coordinate other systems. But then the fields of control systems, information theory, documentation and information retrieval, linguistics, dynamic programming, modern logic, statistical decision theory, and others as well, come one and all to be included. This is an ungainly collection of subfields, comprising men who know little of each other's work, perspective and goals, with boundaries that have been determined by the history of parent disciplines and the flowering of specific techniques."

"No institute can exist to study this field! Selection is necessary: a narrowing of the focus to some coherent wedge."

I have one final comment and that concerns the time it takes to implement and make operational any "information system". Professor Towne has alluded to this problem of applying advanced technology to everyday systems. One retrieval system has been designed to try to reduce the time between the research phase and the time that is needed for the information to filter down to the user. This retrieval system should be added to the appendix A. This retrieval system is operated by the Smithsonian Institute and is called the Science Information Exchange. This whole system attempts to disseminate information about research in progress. For a small fee a keyword search will be made on their data base. I find this service valuable in learning what other innovators are working on and who is involved.

A Reaction Paper to
AN ASSESSMENT OF PRESENT INFORMATION SYSTEMS
AND IMPLICATIONS FOR VOCATIONAL EDUCATION
By Douglas C. Towne

Prepared By

William W. Stevenson

Mr. Chairman, I find myself in an almost untenable position, being a long-time friend of Doug Towne and having borrowed (stolen) many good ideas from him, I find it a little difficult to be as critical of his work as I perhaps should be on this occasion. Asking me to critique or react to a paper by Dr. Towne is almost like asking me to criticize motherhood, the flag, or the mini skirt. But I realize the role of the reactor is to be somewhat the devil's advocate and I shall attempt to fill this role to the best of my ability.

I do hope that Dr. Towne will realize as I react to and criticize his paper how deeply it pains me to speak ill of a so long and revered a friend, but my duty impels me to pick whatever nits I may be able to discover in his fine paper.

This paper is an assessment of present information systems and their implications for vocational education. In making this assessment, the writer has done an excellent job of reviewing the research which relates to the particular question of information systems and the resultant changes which may be influenced by such a system. I must question the author's reference to education as an information system. This seems to be a basic premise upon which he has founded the major part of the presentation which we have just heard. Perhaps we need to consider whether or not education is only an information system. I will agree that an information system may make up a part of the total educational process and a very important part of that process. I must state, however, that I feel that what is implied in an information system is that a great mass of information from largely an outside source is fed into some type of a receptacle. Then through some type of stimulant, the receptacle is prompted to return a portion of this information back to the stimulator. Now, while I fear many teachers and, in some instances, all of us have at one time or another thought that education was simply putting knowledge into a child's head and through a test retrieving that knowledge. We must if we consider the question in depth, realize that education is much more than simply the input and output of knowledge. Education is primarily the process which the receiver goes through in synthesizing,

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analyzing, and digesting knowledge received and in showing evidence of having done this through changed behavior or through expanded understanding. So I think that we must say that while an information system may be a part of education, we cannot say it is the whole of education or that an information system in and of itself is education.

Dr. Towne does present us, as I have said, with an excellent review of the various theories which surround the whole question of dissemination of information and the pursuant or related change process. I realize that the assignment for this presentation requires that questions be dealt with in a conceptual manner rather than a technical treatment of the problem which is before us. I would have preferred that Doug had been given the assignment of describing to us some of the more action-oriented kinds of questions which may deal with the problems of dissemination of information. Knowing his long and worthwhile experience in the area of information systems and having worked with him in attempts to solve some of the problems that are faced by researchers and educators, I know that he can present a practical solution to the questions which will arise as we go through this week's institute. I hope that the discussions which follow will help us build on the conceptual framework which has been presented by Dr. Towne and that we will have an opportunity to begin to develop some very definite guidelines for the efficient and effective operation of information systems within our own state or our own local institution.

The models which have been outlined in the preceding presentation all, as the writer has told us, do have application to problems which may arise as we begin to attempt to keep people informed as to what is happening in relation to education. However, it seems to me that we must go beyond theoretical discussion of what systems may or may not hold promise for effective implementation for each of us and begin to design in the limited time that we have some real solutions to the problems that we have in informing teachers and others. This is not to say that understanding these various systems should be overlooked since such understanding is essential to sound system development. But we must go beyond theory to practical solutions of information dissemination problems.

One idea from the paper which was very helpful to me was in thinking of the model as representing individuals ranging from basic researcher to the user or the practitioner. It is very difficult for me to think of squares and circles as having an active role to play, but if I can think of them as individuals as the author suggested, I find it very helpful as I study the models which have been presented.

I also appreciate the paper's emphasis, in fact, insistence that our educational information system start with the user rather than ending with him. This apparently is not an easy demand to follow and does cause us some difficulty as we begin to try to construct our own system, however, we must keep in mind as Dr. Towne has insisted that the user is the primary client, he is the principle reason for the information system to exist and if the system does not, in fact, serve the needs of the user to the greatest extent possible, it is not as good a system as it should be.

I begin to get concerned as I look at these models and think of them as individuals or as a part of an agency. I see them all in a line and information passing from circle to square to triangle and back to the circle. This reminds me of a game we used to play in which a number of individuals were lined up, the starter at one end whispered a sentence into the ear of the person next to him and without repeating or without any questions being asked, this sentence was transmitted from person to person down to the end of the line. I can remember that we were always amazed at how much the sentence that the person at the end of the line had differed from the sentence as it started at the head of the line. I am afraid that if too many people are involved in massaging, reviewing, or synthesizing, although I realize that some of this has to be done, if too many people are involved in this process, I am afraid that the meaning, the content of the message may be quite distorted by the time it reaches its final destination. I think we must keep these models of information systems as simple as possible and still retain the degree of effectiveness necessary.

One important part of this report which is covered in almost an offhand sort of a way, is his reference to the importance of heterogeneity in the experiences of the professional people in our organization. I agree that it is highly important for us to realize that if we are going to expect a teacher to change, then there must be opportunities for this teacher to be influenced by those forces which bring about change. The teacher must have an opportunity to view and to visit with many different programs and many different people if we are going to expect this teacher to remain current in his ideas. I think that the greatest stimulus to change may be the opportunity that the teacher has to be influenced by many different types of individuals within the school system in which the teacher works, within the professional organizations in which the teacher participates and within the community in which the teacher lives. We must give opportunity to, and encourage the teacher's participation in, a wide variety of experiences. Our requirements that every summer must be spent back in school are pretty narrow when we think of all the breadth of experiences that might be helpful to a teacher. Our insistence that our professional improvement organizations and meetings are the only ones that are really important may be ignoring many, many opportunities for expansion and improvement of the teacher's outlook toward the profession in which he works. So I would strongly second Dr. Towne's idea that heterogeniety of the group is important when it comes to professional improvement and a change.

I think that I have understood the paper correctly in the assertion that there is a strong link between educational change and the information system to which he is exposed or at least the information sources that he has available. I think that there probably are many other stimuli to change which may be more powerful than the information itself. I think some other type of force or influence must first create within our teacher the desire, the willingness and even the need to change and then the information system really becomes effective for the teacher. I doubt seriously if information alone in whatever form it may be presented to practitioners is enough to bring about any great degree of change. I think the information only supplies some direction after the stimulus for change has already been felt and reacted to.

After reviewing all the models covered in this presentation, I still am left with the question which I have had from the beginning. We know that perhaps the most powerful factor for the dissemination of information in the degree which influences change is the personal interaction between the disseminator and the receiver of the information. Seems to me in each of these models, and I certainly stand to be corrected if my interprepation is incorrect, it seems to me that the personal interaction is not evident in any cases in this model. I mentioned this because of the definite feeling that this is the major problem in our own information system. Letters, microfiche, research summaries, and synthesis and analysis of research, while important to some teachers and usable to some teachers, do not influence the great mass of teachers to change to any great extent. They may even be interested in reading some of the summaries which we provide but to really begin to transfer this to practices in the classroom may need individual example and suggestion that can only come through personal interaction. I am not sure that there is any substitute for this personal interaction. If there is, we should search for it or the nearest thing to it because I think this is an essential ingredient if we are to be more than simply a mover of knowledge from one point to another.

The last few minutes of this presentation I would like to spend in reviewing what Dr. Towne has so aptly named the Directed Learning Model. I think this contains many useful and clarifying points. I do think that this model includes many of the methods or procedures which good teachers use at the present time. Objectives, student characteristics, teacher characteristics, the planning of how materials can be related to each of these differing situations is something which generally, I think, is done by the best of our teachers at the present time. This model, of course, formalizes this and presents it to us in perhaps a more understandable--a more organized fashion than we have been able to view it before. I do think that we may to a degree be defeating our own purposes by making all this appear to be so very new and so very complicated. I think if we can take pieces of a system and initiate it section by section, we may have more success than if we try to present an entire system which may appear to be more complicated and more of a change than really is the fact.

The one suggestion which I might have for Dr. Towne's model of directed learning would be that there probably should be feedback arrows so that information review evaluation gets back into the system. I would see arrows going back--particularly going back from the square lettered "I" and labeled "Follow-up Evaluation." Surely this evaluation should influence the learning activities, the materials section, the student assignments and the whole planning area. This one suggestion would, I think, help my appreciation of this model.

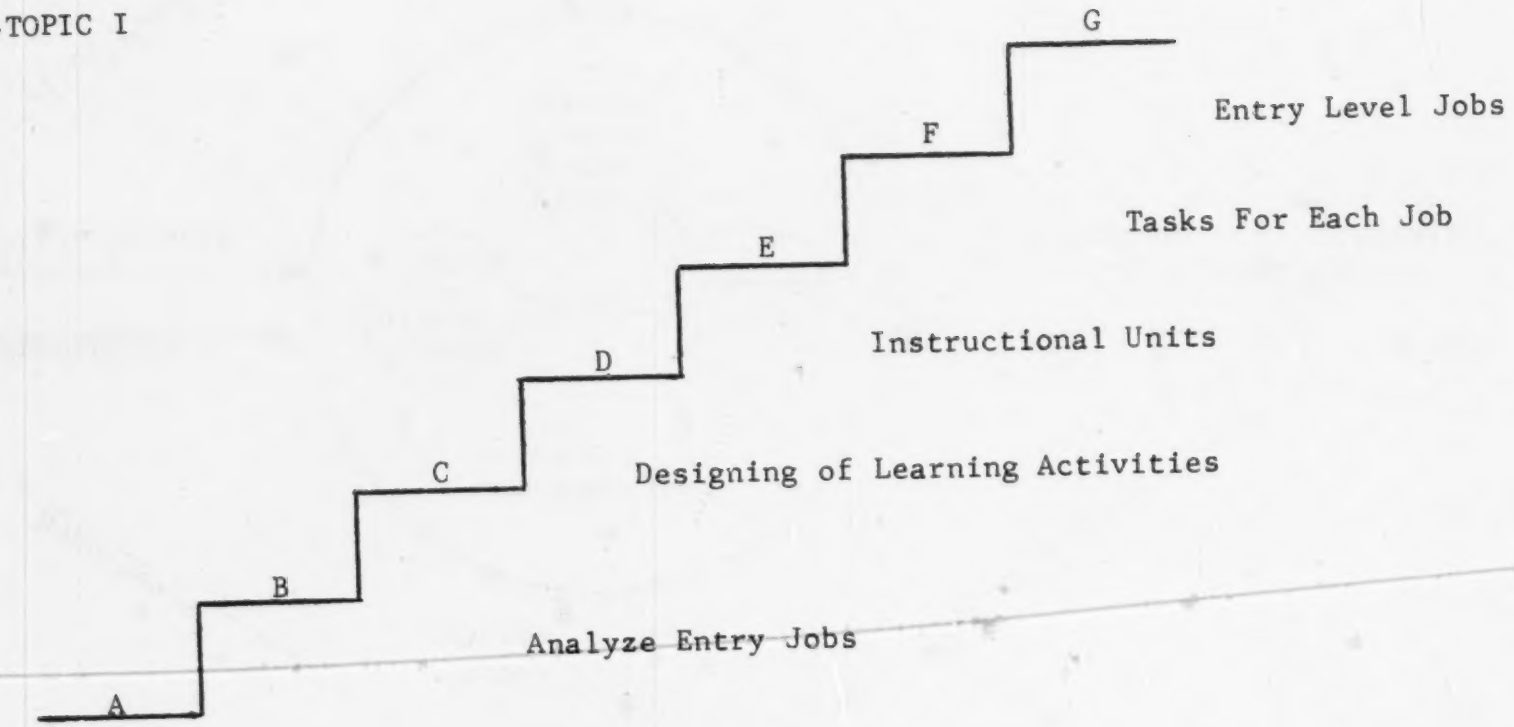
Dr. Towne suggests that he is departing from tradition in his model with the following suggestions: (1) that more than one source of materials should be selected and utilized; (2) that more than one method should be employed; and (3) that students should be served in small groups or individually. I present that these procedures are not this great a

departure from tradition. I do think that we must be cognizant of what Dan Selakovich in his book Social Studies for the Disadvantaged refers to as the "realism of the classroom." We must, of course, be realistic in our expectation of what it is possible for teachers to do under the circumstances in which they find themselves, but I present to you that most teachers do use different methods and materials, and that they do attempt to work with students in small groups on an individual basis as far as it is possible.

To summarize what I have attempted to say in this review of Doug Towne's paper on the information systems, I would like to re-emphasize the following points: (1) We must either design a system which allows for personal interaction between disseminator and receiver of information or we must discover a suitable and acceptable substitute. (2) The information system which we design must be user centered and must be created and operated for the benefit of the user. (3) Feedback for program revision should be an integral part of our information system. (4) We should give credit for and build on those creative things which teachers are presently doing and install our system in conjunction with those good practices which are already happening within our educational community. (5) Information models can help us visualize better the situation we are attempting to create but we should avoid overcomplication of the system so that it begins to be so weighty or complicated as to allow distortion of information.

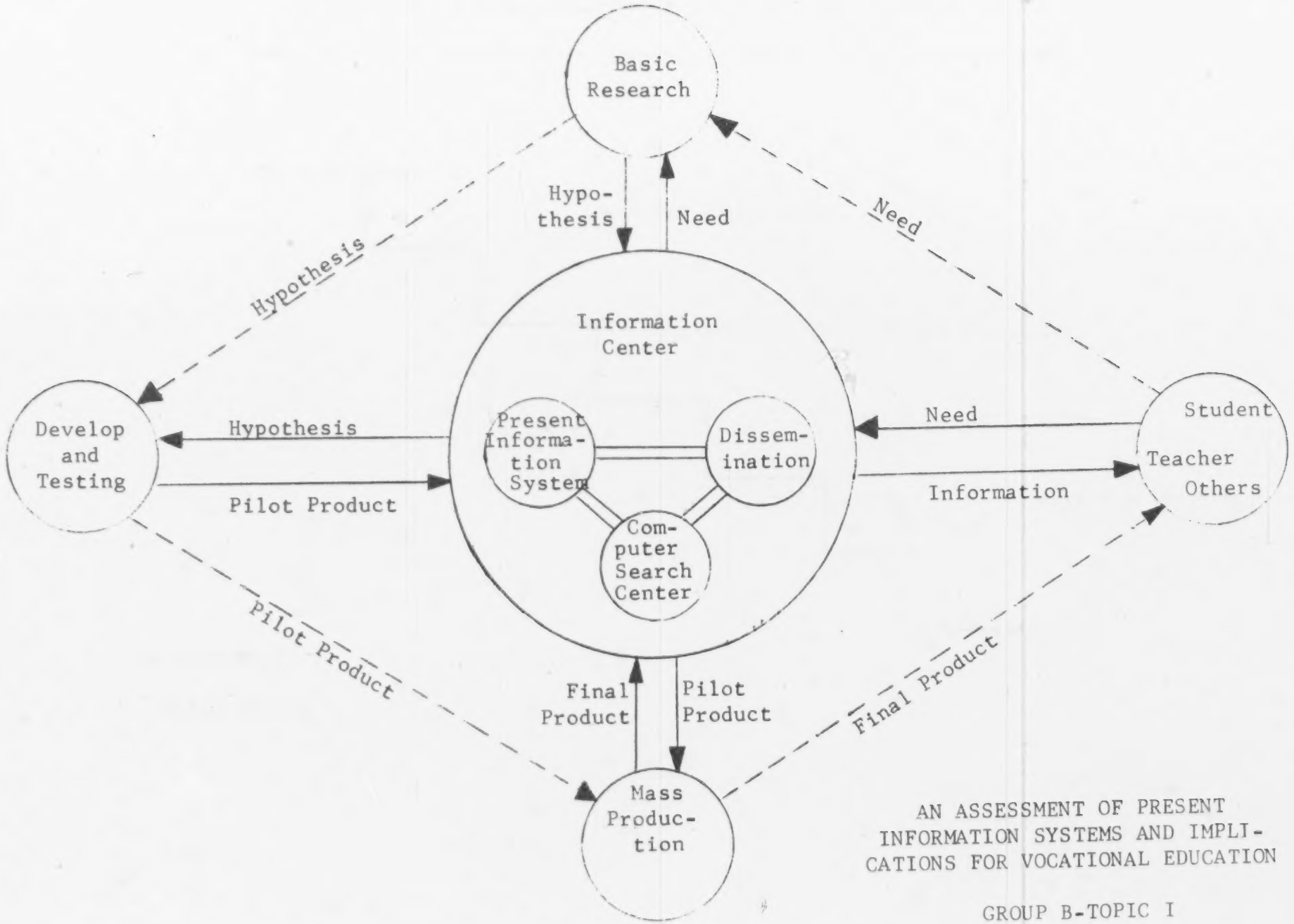
CAREER LADDER

GROUP A-TOPIC I



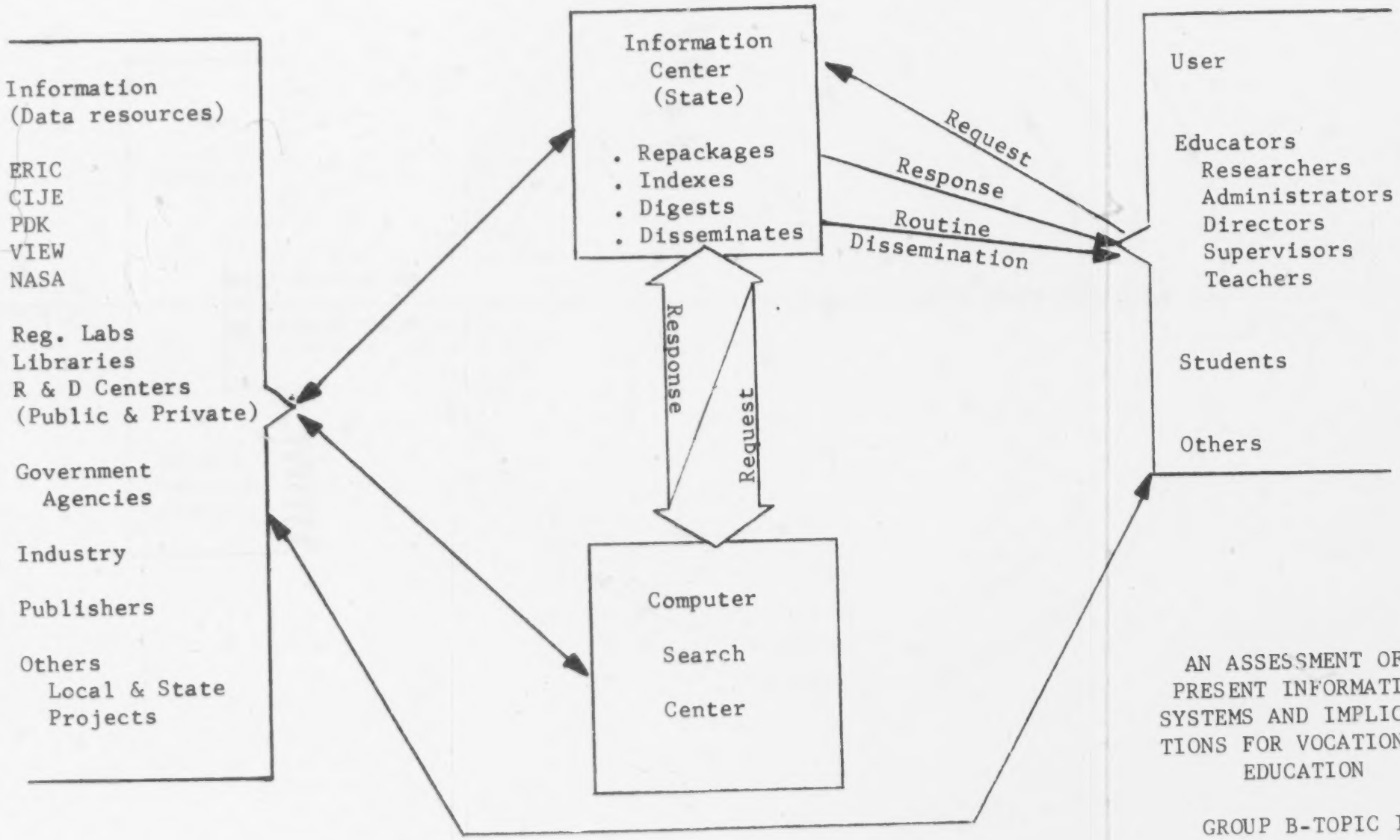
Concepts

Basic concepts that underline the technology identify common basic skills in several vocational areas in which students are receiving training. (Record keeping, basic typing, as well as basic concepts in academic skills - math, English, etc. . .



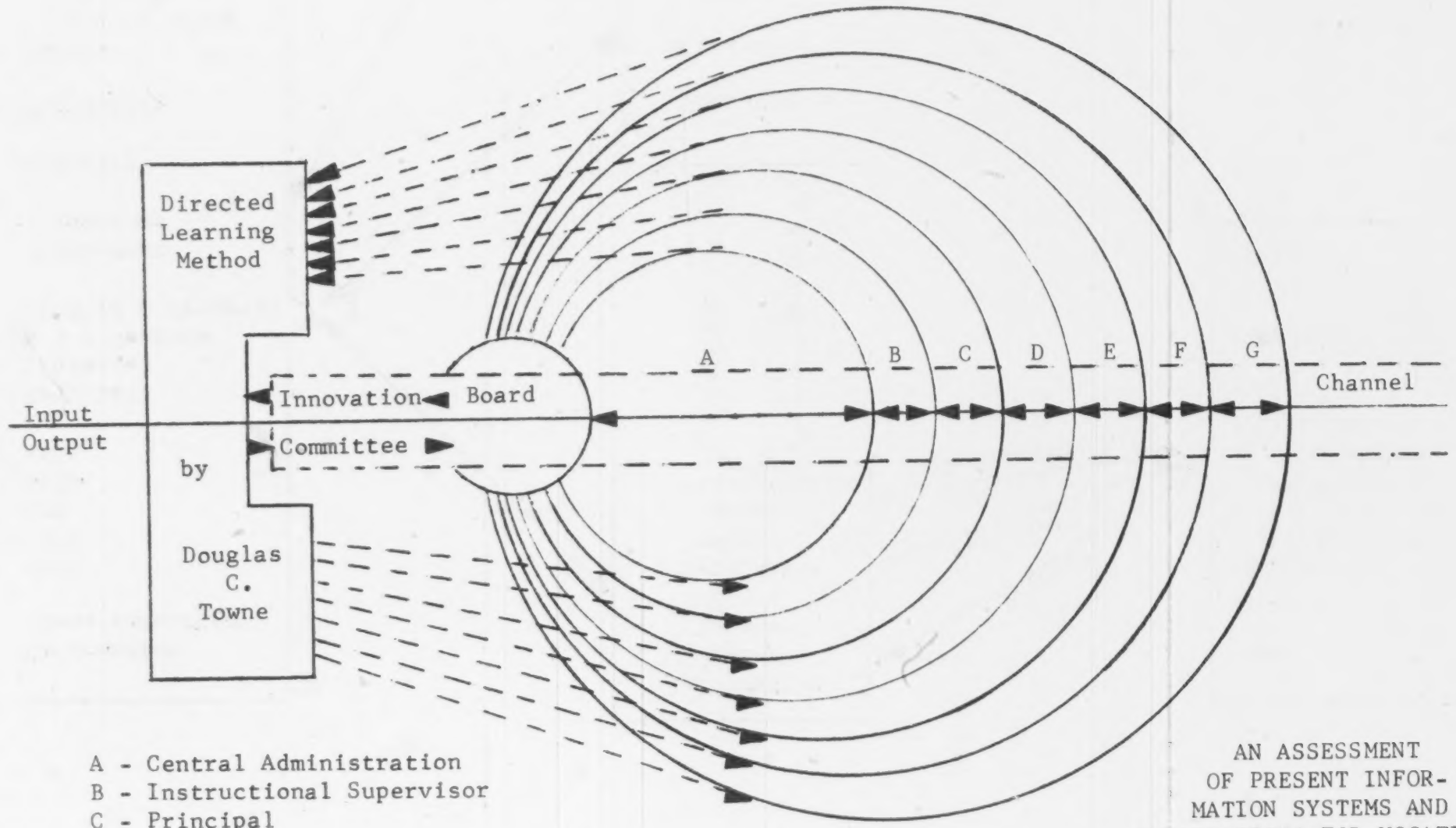
AN ASSESSMENT OF PRESENT INFORMATION SYSTEMS AND IMPLICATIONS FOR VOCATIONAL EDUCATION

GROUP B-TOPIC I



AN ASSESSMENT OF PRESENT INFORMATION SYSTEMS AND IMPLICATIONS FOR VOCATIONAL EDUCATION

GROUP B-TOPIC I



A - Central Administration
B - Instructional Supervisor
C - Principal
D - Teachers
E - Students
F - Parents, Ex-students, Employers, Taxpayers
G - State, Federal

AN ASSESSMENT
OF PRESENT INFOR-
MATION SYSTEMS AND
IMPLICATIONS FOR VOCATIONAL
EDUCATION

GROUP C-TOPIC I

SUMMARY OF PROCEEDINGS

SESSION II - INSTITUTE IX

INSTITUTE IX
II SESSION

SYSTEMS ANALYSIS AS AN INSTRUMENT FOR
CHANGE IN URBAN EDUCATION

The following items require an empirical approach in the implementation of the systems analysis approach in vocational education:

1) Educational goals must be set forth in specific quantifiable terms (performance specifications).

2) Alternative strategies and constraints must be presented and evaluated.

3) We must then identify the best alternative and implement.

4) The evaluation should result in a systems modification depending on the results achieved.

The following questions require further study and analysis for developing models, flow charts, and/or guidelines required in the implementation of the systems approach in vocational education:

1) What combinations of manipulative and cognitive skills are necessary to prepare a person for today's jobs and the demands of a complex community life? Can we combine vocational and general education through the use of technology (or other procedures) in such a way that the academically oriented student will profit?

2) What methods can be found to anticipate or intercept students who may drop out of school so that they might be redirected to more meaningful or rewarding programs?

3) What means might best be made available to teachers and faculty members for them to test out alternative ways of teaching students of varying backgrounds and interests?

4) How can appropriate educational opportunities be made available to older adults at a time when they are most needed without undue economic sacrifices?

5) What alternative methods can be designed for adult education programs where adults want a different form of instruction or instructional approach.

A Reaction Paper to
SYSTEMS ANALYSIS AS AN INSTRUMENT
FOR CHANGE IN URBAN EDUCATION
By David S. Bushnell

Prepared By

Dr. L. Paul Robertson*

Systems engineering has been used with success in many areas of our society. Problems in communications, space technology, weapons systems, and transportation have been solved using this method. It is only logical to extend the use of systems analysis to the design of educational systems. I would like to add to the description of systems analysis given by Mr. Bushnell. The technique requires a detailed examination of the educational process as a whole with cognizance of the relationships involved in and among all component parts of the process. A model of the system is constructed which not only assists in clearly describing and clearly showing the real life situation as it is, but also aids in determining the effects of change and innovation to component parts. Those who want to change and improve mankind will certainly want to produce models which introduce new ideas. One way of doing this is to develop a model of real life and then gradually vary elements in the system to see if there are optimum conditions which would result in better outcomes.[1] Models may take several forms including narrative, graphic, flow chart, and mathematical types. It has been my experience that although mathematical models, with their precise expressions relating component interactions and feedback, are perhaps the goal, the flow chart model technique is the starting point for most teachers and educators. It is also prerequisite to mathematical modeling. We can synthesize flow charts for relatively complex educational systems, but I have serious reservations regarding the possibility of ever being able to create a true, precise mathematical model of human behavior. Two obstacles prevent this degree of precision-judgements regarding value (good-bad, etc.) and the irrational acts of humans. It is questionable as to whether or not logic (mathematics) can be applied to the human illogical or irrational-behavior-subsystem or the value-judgement-subsystem. Fortunately, this degree of precision and predictability is not required in many of our educational systems.

I am sure we will all agree with Bushnell's statement that there is pressure on the vocational educator to discover more effective ways of coping with the demands and frustrations of the groups not being effectively served through public education.

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[1]Leonard C. Silvern, The Evolution of Systems Thinking In Education. Los Angeles: Education & Training Consultants Co., 1965, p.118.

His contention that educational systems are more complex than training systems is well taken; however, he fails to differentiate between the two. It is obvious that both education and training are concerned with human learning and that they share the technical problems of content and method, but they differ in purpose. Training is undertaken to serve the needs of a particular system, while education aims to fit persons to take their places in the many systems of society. In training, a program of instruction is designed to fit the trainee to a particular job, while a specific job is not normally foreseen in education. In public education a training activity is a subset of an appropriate educational activity. Business and industrial programs are usually training programs and contain little education. However, there is unquestionably considerable training to be found in public education.[2] The problems encountered in modeling either of these two systems are quite similar and have more in common than might appear at first glance.

As most system designers will proclaim, the hardest part of a systems design is in deciding what one wants to do. It seems so simple to insist that an educator pin down his objectives and criteria before he designs his system, but few ever really do. The hard fact is that criteria must relate to feasible systems and people often do not know what is feasible until they have tried to design something.[3] The logical starting point in the analysis of an educational system is with an examination of its basic philosophy. This results in general expressions of educational goals and broad objectives, and it is here where most teachers and educators stop. One major reason for not preparing specific objectives is that few teachers know how. Bushnell's paper contains an excellent discussion of the characteristics of specific objectives which should prove beneficial to us all. Mager[4] describes the form of a correctly stated objective as "a statement which identifies the educational objective (content) and describes the behavior of the student (performance) when he demonstrates he has learned that objective." As Bushnell points out, the preparation of these specific "content-performance" objectives shifts the emphasis from what the teacher does to what the student does.

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[2]Meredith P. Crawford, Psychological Principles in System Development (Robert M. Gagne, editor). New York: Holt, Rinehart, and Winston, 1962, p. 302.

[3]Myron Tribus, "Goals and Goals", Journal of Engineering Education, December, 1966, p. 283.

[4]Robert F. Mager, Preparing Instructional Objectives. Palo Alto, California: Fearon Publishers, 1962, p. 4.

The teacher plays a new, learning-manager role. This approach radically changes the basis for decision-making. With the emphasis upon the system output (i.e., student learning), it requires the educational system to achieve the desired student performances by whatever techniques and methods are found to be most effective.[5] Classes are used only if that is the most effective and efficient method of achieving the desired student learning. The emphasis shifts to the learner - his needs, strengths and weaknesses.

Frequently the course or lesson objectives will be determined in part by the student. He learns more if he knows these objectives. This shift results in mastery of the subject matter by almost all of the students. Current practice is to have student-mastery a variable with grades given in accord with the variance. Individualized instruction tends to make student-mastery a constant; further it tends to make "time-required" the variable. The administrative time unit such as the semester tends to have much less significance. The real questions become "what can a student do when he enters a course?" and " what can he do when he leaves?"[6] These radical departures from the traditional approach require the participation of administrators and others involved with policy matters. More importantly, a systems analysis will reveal the possible repercussions resulting from these and similar changes.

The problem areas discussed by Bushnell illustrate that systems analysis techniques can be used in many varied ways. A system depends upon the objectives chosen and can be used for cost analysis, budgeting, and other functions related to education. We may well be forced into performance-accountability by the many performance-guaranteed contract schemes appearing on the commercial scene - this is a natural for systems analysis.

The techniques for elementary systems analysis are known. Bushnell fails to discuss why educators are not attempting this approach. Some of these reasons include: lack of agreement upon objectives and the inability to establish clearly-defined objectives; current basis for school financing such as average-daily-attendance rather than student achievement; tradition that "good"schools are determined by physical facilities and that "good" teachers are determined by the number of degrees held; hostility toward teaching (or school) evaluation using objectives as criteria; legal problems caused by current state laws; accrediting agency requirements; and the traditional conservatism which is characteristic of education.

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[5]Robert Heinich, Application of Systems Thinking to Instruction. Los Angeles: Education & Training Consultants Co., 1968, p.21.

[6]Arthur M. Cohen, Dateline 70: Heretical Concepts for the Community College. Beverly Hills, California: Glencoe Press, 1969, p.188.

Mr. Bushnell's paper adequately supports his premise that systems analysis is an instrument for change in urban education. It is a problem-solving method and not a cure-all. It is a disciplined way of defining objectives, of analyzing and synthesizing the operational components comprising a system, and of modeling the system in meaningful ways. The future of vocational education and of our vocational education students is whatever we decide to make it. "More than ever before. . the task is not so much to guess where we will likely be, but to decide where we would most like to be."[7]

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[7]Robert Bicker, Inventing Education for the Future. (W.Z. Hirsch, editor). San Francisco: Chandler Publishing Co., 1967, p.61.

A Reaction Paper to
SYSTEMS ANALYSIS AS AN INSTRUMENT
FOR CHANGE IN URBAN EDUCATION
By David S. Bushnell

Prepared By

Dr. Harry Huffman*

Comments on the Impressiveness of the Paper

It is a pleasure to react to this very impressive paper. It is thorough, comprehensive, and conceptually oriented. It is a paper with tremendous substance and does point the way to a better method of making changes in the urban education scene. This paper is one that can be reacted to as opposed to one which requires the reactor to prepare a paper on his own.

In giving my reactions, I am not being critical but rather raising a few questions and giving some experiences I have had with the process of systems analysis. I assume that Dr. Bushnell has the definition of a system something as follows, at least from the standpoint of a representation of a system: It is a diagram or flow chart of an activity or an organization containing the interrelated and interacting parts which are employed to produce or achieve predetermined purposes.

Holistic Approach

On page 2, Dr. Bushnell mentions the need for the holistic approach. I heartily agree with the need for a holistic approach. In using "holistic," I gather Dr. Bushnell believes that a "whole" can not be analyzed without residue into the sum of its parts or reduced to discrete elements. There are a number of cautions that go with the holistic approach which Dr. Bushnell mentions involving taking into consideration the total educational activity at all levels. It is an unnerving experience since looking at the total system is something like opening Pandora's box or the can of worms. To the unforewarned, the examination of a total system and all of its interrelated and interacting parts is frustrating and sometimes discouraging since the number of variables brought under view is very large. The minute examination of one variable seems to cause changes in all the others, particularly if we are looking at a humanly-oriented or -contrived system. Limited manpower and finances have often prescribed that we in education and in educational research often dwell on small subsystems in the total system and do not pay attention to the fact that the total system was altered when we examined the subsystem.

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*Dr. Harry Huffman, Professor, Department of Vocational Education, Colorado State University.

Redundancy of Humanly-Contrived Administrative Systems

On page 4, Dr. Bushnell mentions the difference between a centrally controlled military system and the decentralized, locally managed school district. You can liken a locally managed school district to a number of redundant systems whether or not these systems are explicitly described or written down, which they usually aren't. At any rate, most humanly-oriented or -contrived systems are redundant, meaning that somehow or other the job staggers or muddles on. I am referring to systems where the manager or administrator "flies by the seat of his pants" or follows the procedure of "putting out the brushfire" whenever necessary. These are systems even though they are not explicitly written down. In these systems there is often resistance to examination because some other redundant system will take over or even two will temporarily combine. Each of you have a system for returning to your jobs. If something happened to the airline you were planning to return on, very likely a number of you would develop other systems for return. You would say there is more than one way to skin a cat. Most decentralized, humanly oriented systems are redundant. They permit creativity and a small breakdown is remedied by using an alternative to provide for at least minimum efficiency. I am certain that Dr. Bushnell is concerned with systems that provide for optimum or maximum efficiency and also systems which can be explicitly written out in a flow chart, PERT form, or the planning, programming, and budgeting form known as operations research or PPB. The advantage of these systems is not only that they are explicit, but they permit other people to develop subsystems that are coordinated and efficiently interrelated.

The Centrality of Behaviorally-Stated Objectives

I just completed a project which is at the moment being edited and designed for publication. The project is entitled "Writing Performance Goals: Strategy and Prototypes, A Manual for Vocational and Technical Educators." A very large number of consultants were involved in this project which will be published cooperatively by The Center for Vocational and Technical Education at Ohio State University and McGraw Hill Book Company. In this project a number of subsystems were developed to provide a total system for generating behavioral objectives or performance goals, these terms being used synonymously. The system for generating performance goals, if it proves successful which I hope it will, may fill in a gap for educators, particularly vocational and technical educators. The system is based on the principle that with some kind of an analysis such as a job or task analysis it will be possible to generate well-stated behavioral objectives or performance goals.

I think that Dr. Bushnell was very wise in placing the need for well-stated objectives as one of his first concerns in developing a system for making changes in urban education. In connection with the terminology that Dr. Bushnell uses, I have a few questions: Does not the word "terminal" in the minds of many people imply the ultimate end in either formal or informal education? Does not the word "interim" imply something ambiguous? I have found that these terms present roadblocks when working with vocational and technical teachers.

I would rather talk about behavioral objectives or performance goals and where necessary talk about prerequisite behaviors to a particular performance goal under consideration.

Vertically Sequencing and Lateral Grouping

Then also I have included in my system some concern for vertical sequencing of behavioral goals and for laterally grouping where they do not necessarily build upon one another but merely broaden the job or performance capabilities of the student. From my apartment balcony I look out at Long's Peak, one of the highest mountains in Colorado, and for some time I have been planning to hike to the top. In making preliminary hikes I found that there were various goals such as hiking up to one of the alpine creeks at the lower part of Long's Peak. Further up there is a beautiful waterfall where you might be fortunate enough to see water dippers. Somewhat further is Storm Pass which is the beginning of the end of the treeline. Each of these are very beautiful places and are achievements in themselves. Further on you can go to Granite Pass and be considerably above the treeline and look out in the valleys around. Then further on you can hike to Boulder Field which is a flat area covered with huge boulders where, with permission, you can camp if you are like me and need to have a place from which to embark for the Peak. All six of these are achievements in themselves and I think that they are worthy of recognition. I have not expected to take my wife to the Peak, but she has visited with me some of the other points of interest which lead on, of course, to the Peak. The reason for mentioning this is that I have heard teachers telling their students that they wanted to be sure that they all had the right to fail, no matter how unrealistic or hopeless the goal may be. According to the teacher any student in any class had the right to fail, meaning that he had a right to go on to college for his Ph.D. I would rather say to the student, "You have a right to achieve some of these things such as the alpine creek or Storm Pass, Granite Pass, or Boulder Field, or the Peak itself. Every one of these is worthy of achievement. In fact it would be better to concern yourself in a vertically arranged sequence with achieving the first one and then concerning yourself with the second one, and so on."

Roadblocks to the Systems Approach

In working with the systems approach I have found two roadblocks that we need to overcome in helping teachers deal with the development of well-stated behavioral objectives in output terms. The first problem seems to be that teachers have to distinguish between their behavioral objectives and those they are developing for the students. It takes some time for good-hearted, experienced teachers who have operated in the input system to convert themselves over to thinking in terms of the output system for their students. Sometimes teachers are "turned off" by the output system. Furthermore, as a second problem, teachers who are really ham actors (and this includes some of our better teachers), will claim that it is impossible to describe the unique contribution of their class to the students. This situation occurred at Green River Junior College where one of my former advisees, Dr. Ray Needham, is.

They said it was impossible to put down on paper in output terms their unique contribution. I gathered from Dr. Needham and his staff that these instructors were asked how much of the course was their unique contribution and several answered 10 or 15 percent. Consequently, the teachers were requested to get on paper the 85 to 90 percent of the desirable behaviors that they planned for their students. I think that we all can consider the possibility that some teachers may make a unique contribution that may be difficult to put on paper. It is, however, the 85 to 90 percent that should be gotten on paper so that the total system can be examined by all of those concerned and we can try to improve the efficiency of the educational system.

The Student as a Set of Redundant Systems

I have already mentioned that a humanly-oriented or -contrived system frequently is a set of several redundant systems. I think that you can look upon each student as a set of redundant systems many of which are inexplicit and appear not to be fully flow chartable. I am not suggesting that we try to flow chart the human being, the student, even though we have tried to prepare many models. I think, however, there is one system within the student that we should try our very best to graph and that is his payoff system and let the rest of his redundant systems remain a mystery if they have to. In the book prepared by the Aerospace Education Foundation entitled Technology and Innovation in Education, Israel Goldiamond dealing with motivation emphasized the fact that it is very important to find out a student's payoff system so that he can be properly reinforced for making progress. This is in line with our discussion today of a system of educational technology which includes behavioral objectives and hopefully a contingency management system. Therefore, I would like to emphasize that we need much more effort in studying a particular subsystem and that is the payoff system of such students as those classified disadvantaged, handicapped, and others who are not responding to our present educational system.

Other Experiences in Preparing Prototype Performance Goals or Behavioral Objectives

Problem of Ambiguous or Imprecise Situations

One of the criticisms or objections that a few educators make to preparing explicit behavioral objectives is that they will not prepare the student to deal with ambiguous and imprecise situations. In preparing the models for producing or generating performance goals, I found that there are approximately twelve to fourteen conditions that must be considered in producing a performance goal and one of the conditions certainly deals with the ambiguity or preciseness, the degree of ambiguity or preciseness, of performance statements that represent what the student will try to achieve. It seems to me that there should be no problem in teaching students to deal with ambiguity and lack of precision if the series of behavioral objectives are organized in vertical form so that the student gradually learns to deal with ambiguity which is often called decision-making or thinking. Another question raised

is that of generating the affective type of behavioral objectives. The models and prototypes that we have developed have a place for all the elements which are called cognitive, psychomotor, and affective. It seems that any one particular performance goal or set of performance goals is not solely one thing or another but is a combination of these elements. The nearest type of behavioral objective that we developed that contains a considerable degree of the affective element was one dealing with the general problem of obtaining or eliciting information as is done by a receptionist or a public contact person in a business or industry. Other behavioral statements dealing with distributive education have large elements of the affective all of which seem ultimately to be based on a large amount of the cognitive element and the ability or skill to bring up alternatives that are appropriate to a particular situation.

Change Agent

On page 9, Dr. Bushnell talks about "systematic strategies for change" and I think this is very good when he mentions simulation and I hope that he plans to include a system of preparing change agents who help the adopting type, the average person, help them adopt some of the new, proposed changes. Dr. Bushnell then takes up six areas about which I will make a brief comment.

In one, matching students with job opportunities, I would like to mention also the work done by Dr. David J. Weiss in the Work Adjust Project at the University of Minnesota. I was very much impressed with some of the things they are doing in helping young people look at job opportunities that may provide a satisfactory adjustment to them. As I mentioned previously, Dr. Needham was one of my former advisees and in his doctoral dissertation he developed a system for forecasting technical job training needs. A byproduct of this, of course, was to make such information available to prospective students concerning newly emerging job opportunities.

In the second topic, in connection with vocational teacher preparation, I think that an additional element of preparing vocational and technical teachers particularly in the urban areas to deal with learning management rather than the former activity of teachers of presenting information of using other traditional techniques including aversive techniques. It seems to me that a total system of learning management should be taught to teachers which would include the other elements such as instructional aids, performance goals or behavioral objectives, contingency management, and other elements of good teaching would be very important in a modern teacher education program.

In connection with area three, administrative and organizational operation, I would like to underline the point of the need for better lines of communications and public relations within the system as well as outside the system.

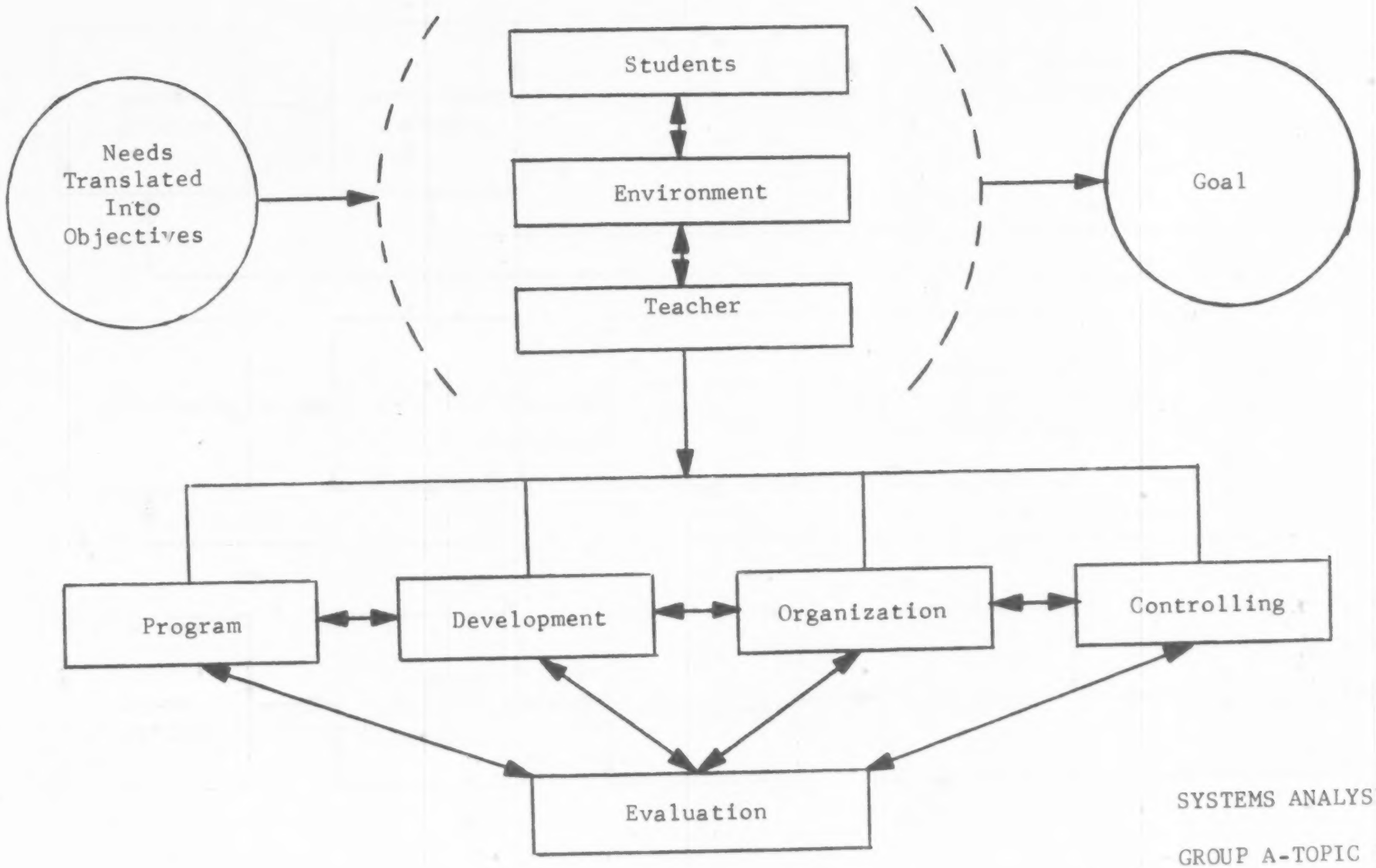
In connection with area four, individualized instruction, I have already mentioned that one way to improve on all of the individually prescribed instruction systems is to have the capacity for identifying

the payoff system of individual students. If we look upon the student as a continuous learner throughout his lifetime and then concern ourselves with what works for him and remembering the fact that he is going to learn all of his lifetime, we may be much better able to provide what he needs educationally throughout his lifetime.

Number five, simulation and troubleshooting, I can certainly recommend that everyone prepare a flow chart of each major piece of work he does as a means of clarifying it. I have almost always on my wall flow charts of projects that I am carrying out no matter whether they are formal or informal. Last summer each student in one of my graduate classes prepared a flow chart of the production of his major paper for the course which was used as a means of clarifying his thinking and helping him produce something substantial and worthwhile.

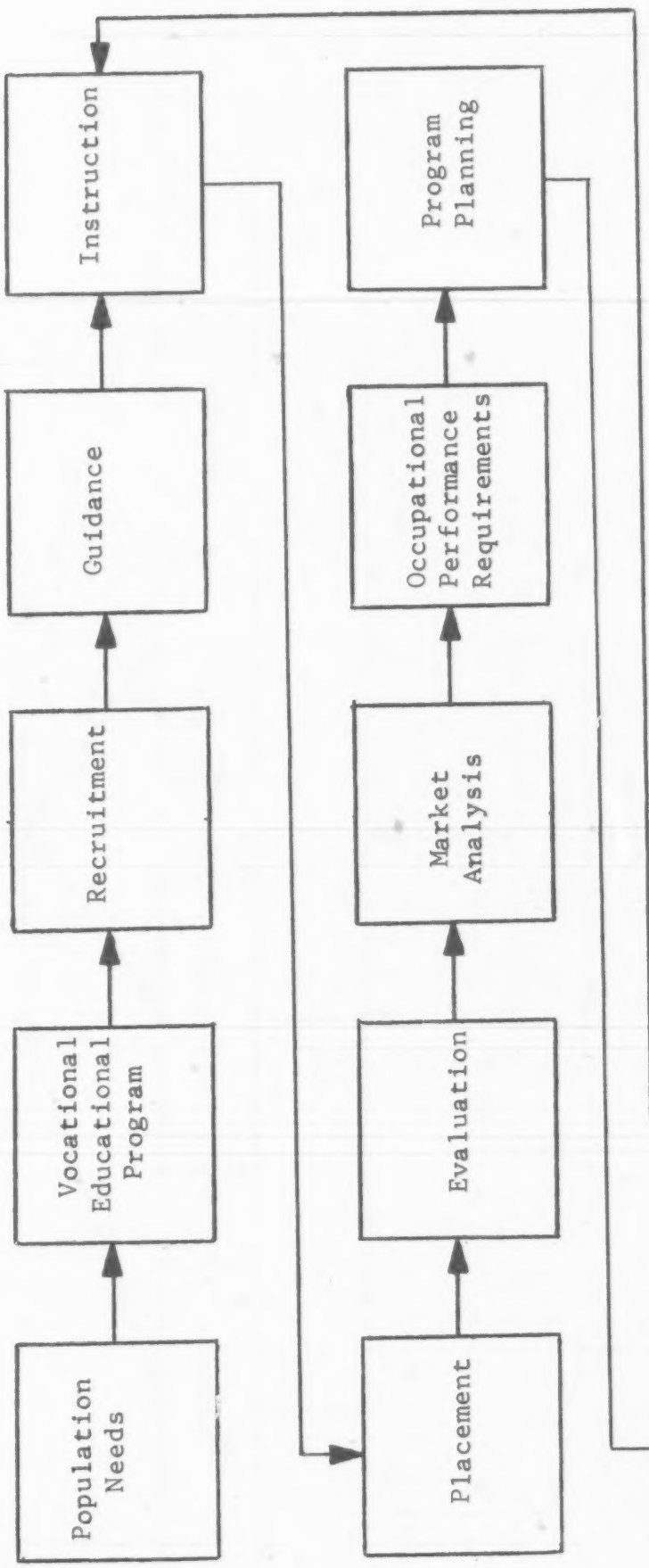
In connection with six, continuing education, I would add that every student should be confronted with behavioral objectives that say to him, "Given this new situation, what tactics are you going to use to deal with it or learn about it." In other words, in formal education students should have explicit, carefully sequenced help in building tactics of independent learning so that they can confront new situations.

In the last topic, Dr. Bushnell talks about the need for further research and I would like to conclude with a plug for more understanding of the payoff system of individual students.



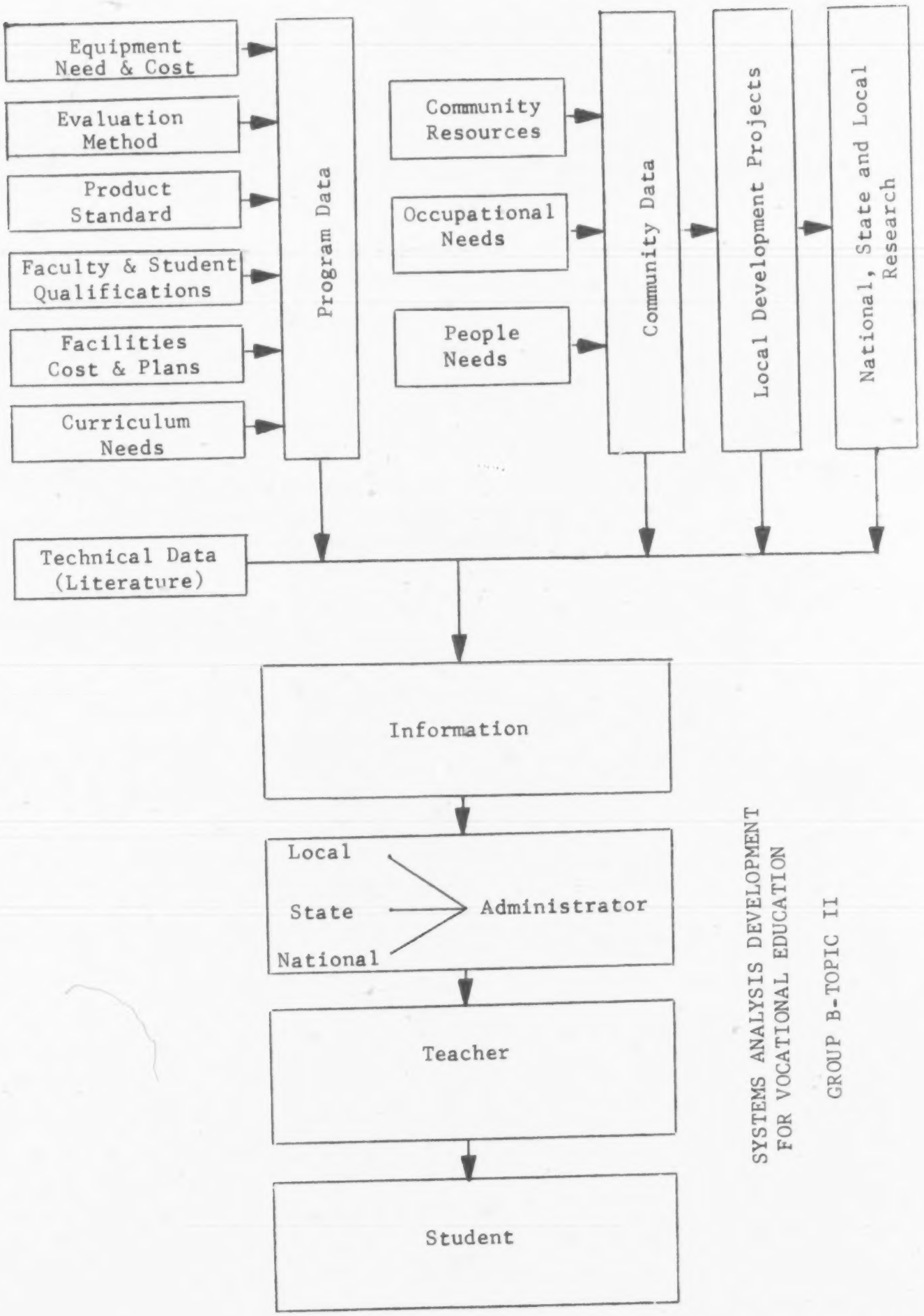
SYSTEMS ANALYSIS

GROUP A-TOPIC II



SYSTEMS ANALYSIS DEVELOPMENT
FOR VOCATIONAL EDUCATION

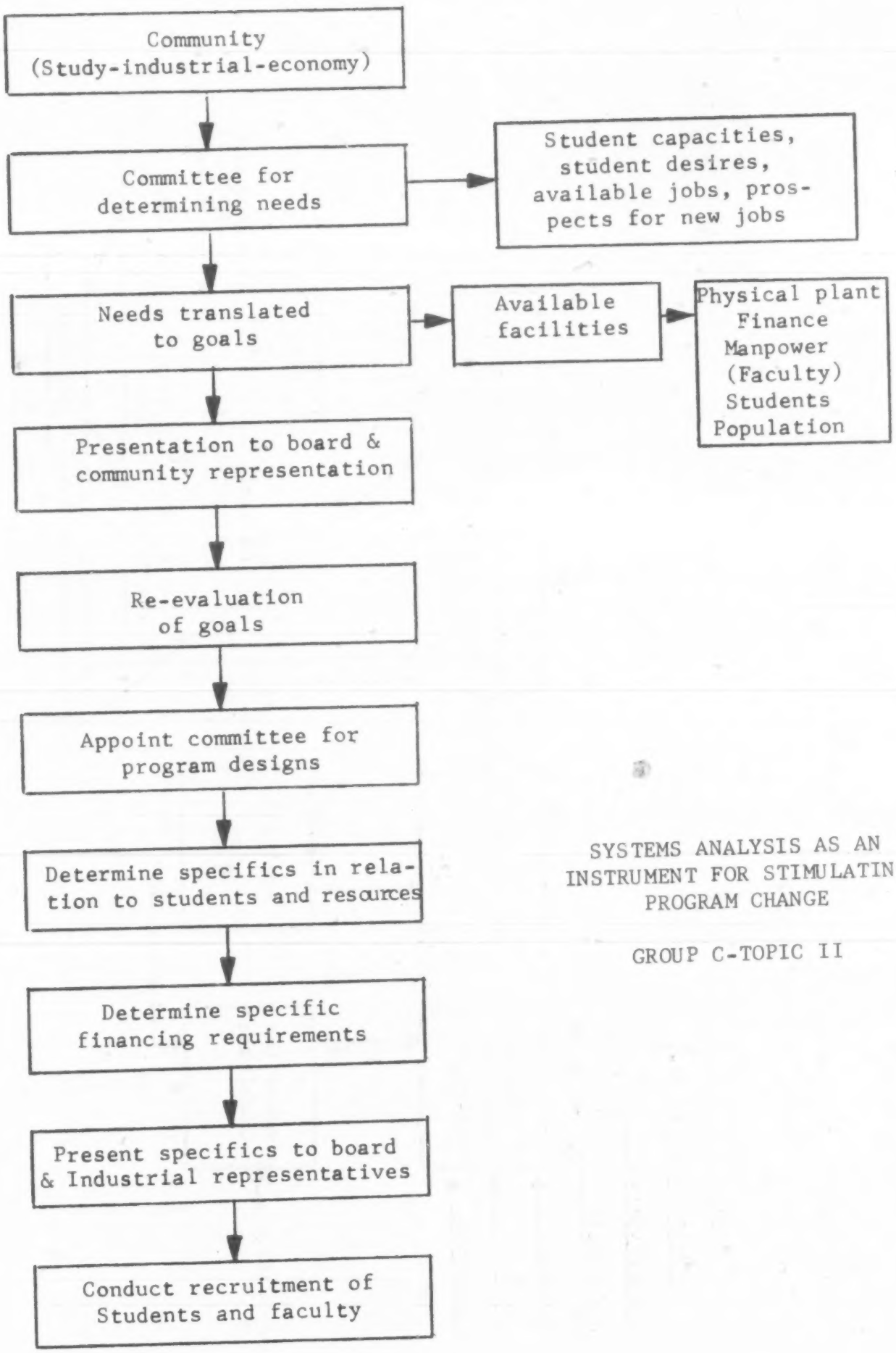
GROUP B-TOPIC II



SYSTEMS ANALYSIS DEVELOPMENT
FOR VOCATIONAL EDUCATION

GROUP B-TOPIC II

A Systems Analysis Flow Chart on Topic II
Has Been Developed By Group B and
Is Included in Appendix G

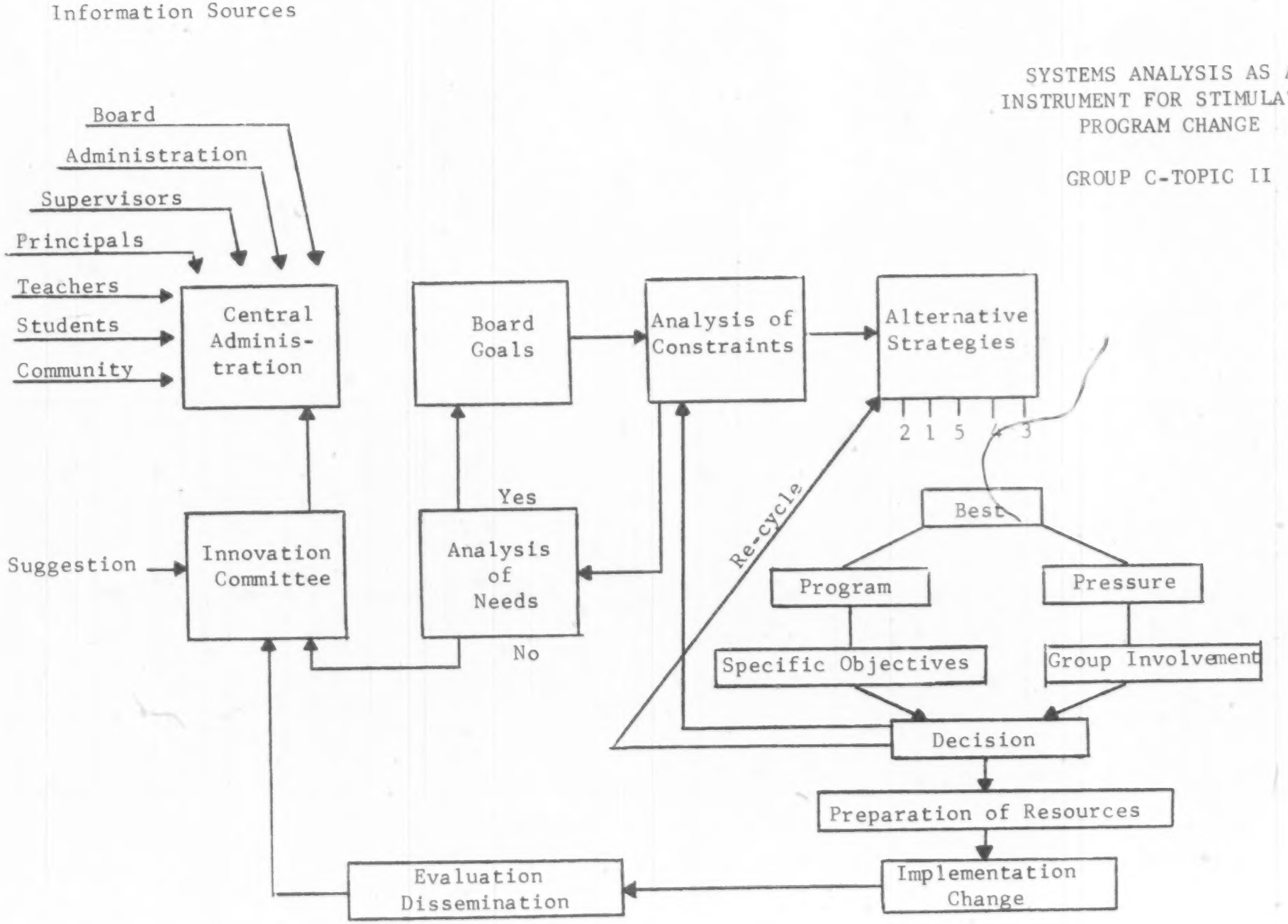


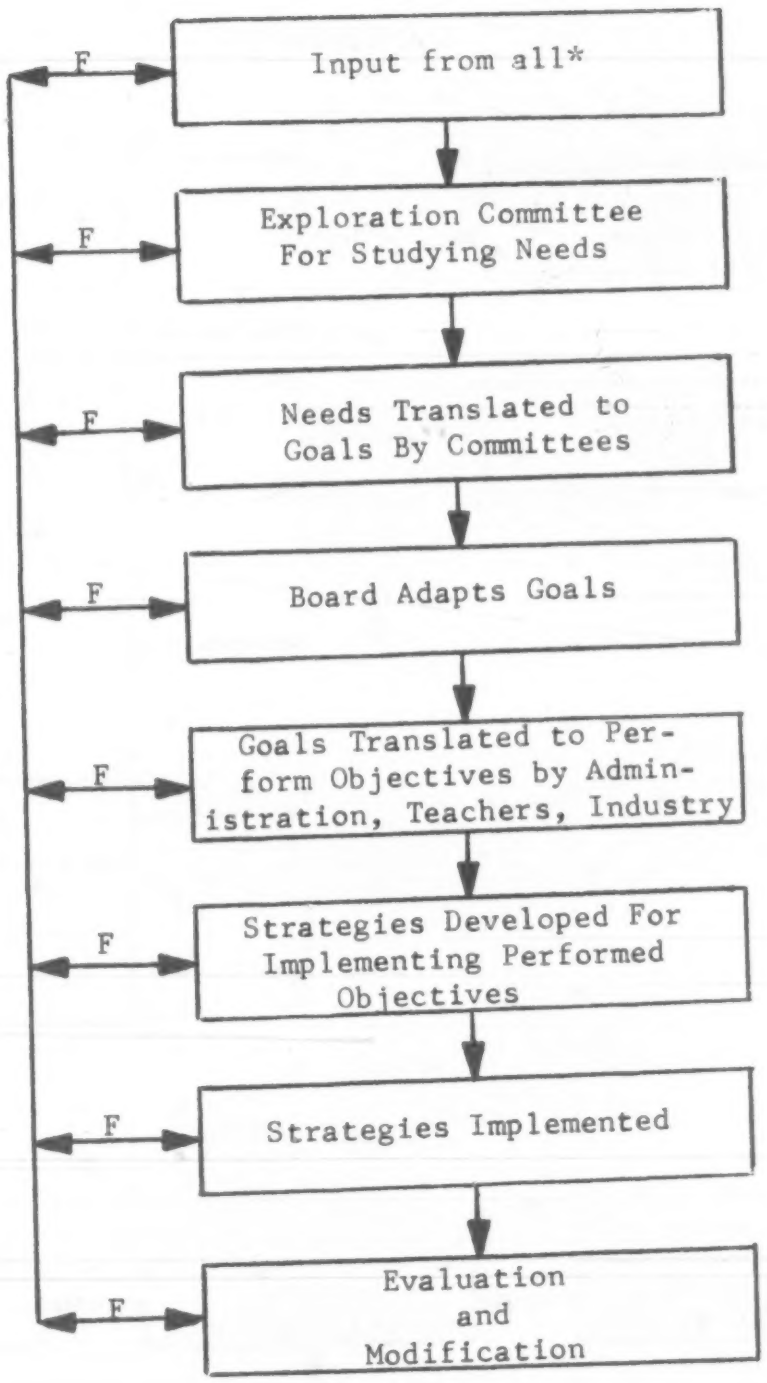
SYSTEMS ANALYSIS AS AN
INSTRUMENT FOR STIMULATING
PROGRAM CHANGE

GROUP C-TOPIC II

SYSTEMS ANALYSIS AS AN
INSTRUMENT FOR STIMULATING
PROGRAM CHANGE

GROUP C-TOPIC II





*Community, state department, board, central administration, teachers, and students

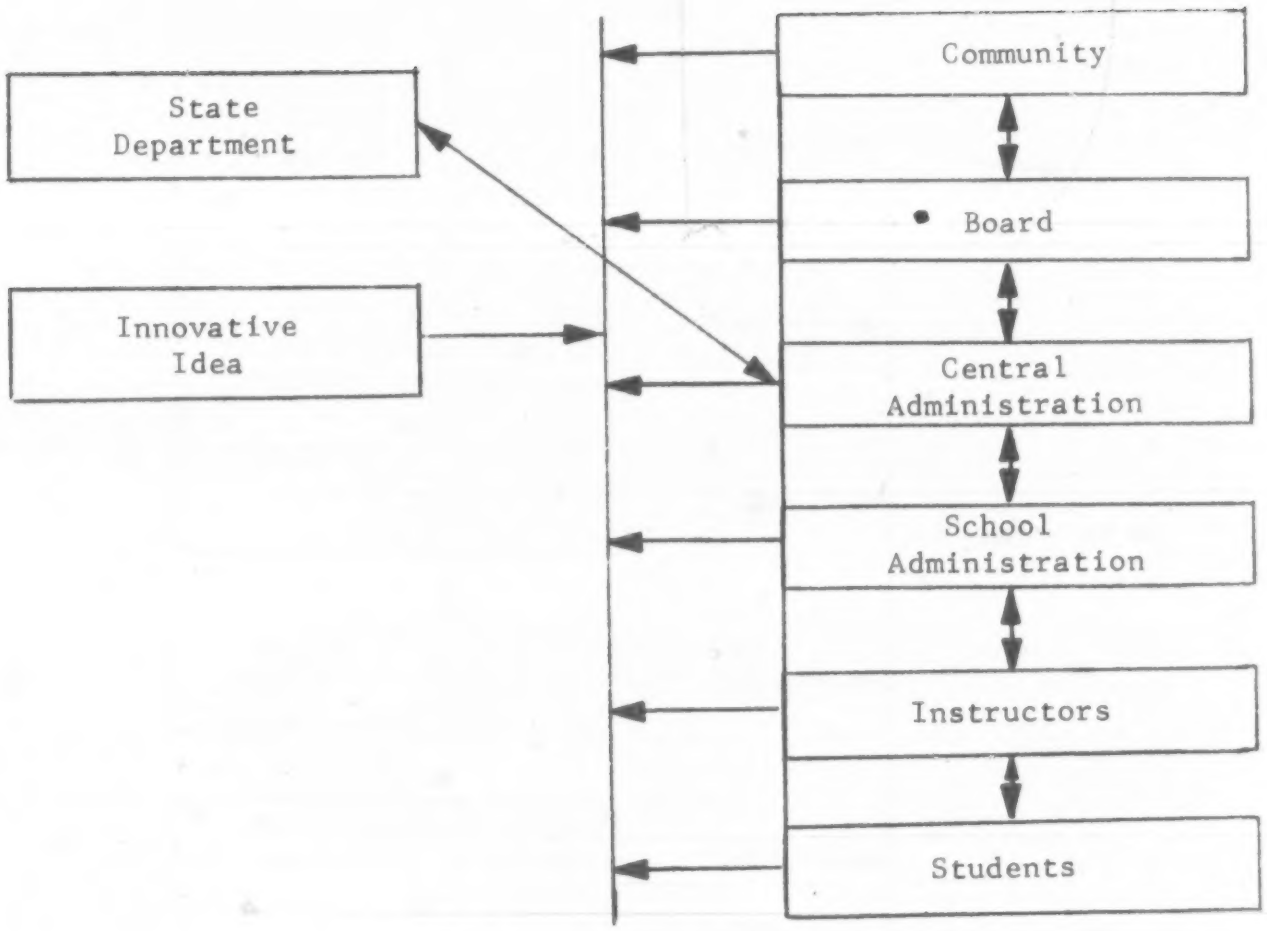
Each step is a complete subsystem with systems approach applied to it.

F = Feedback

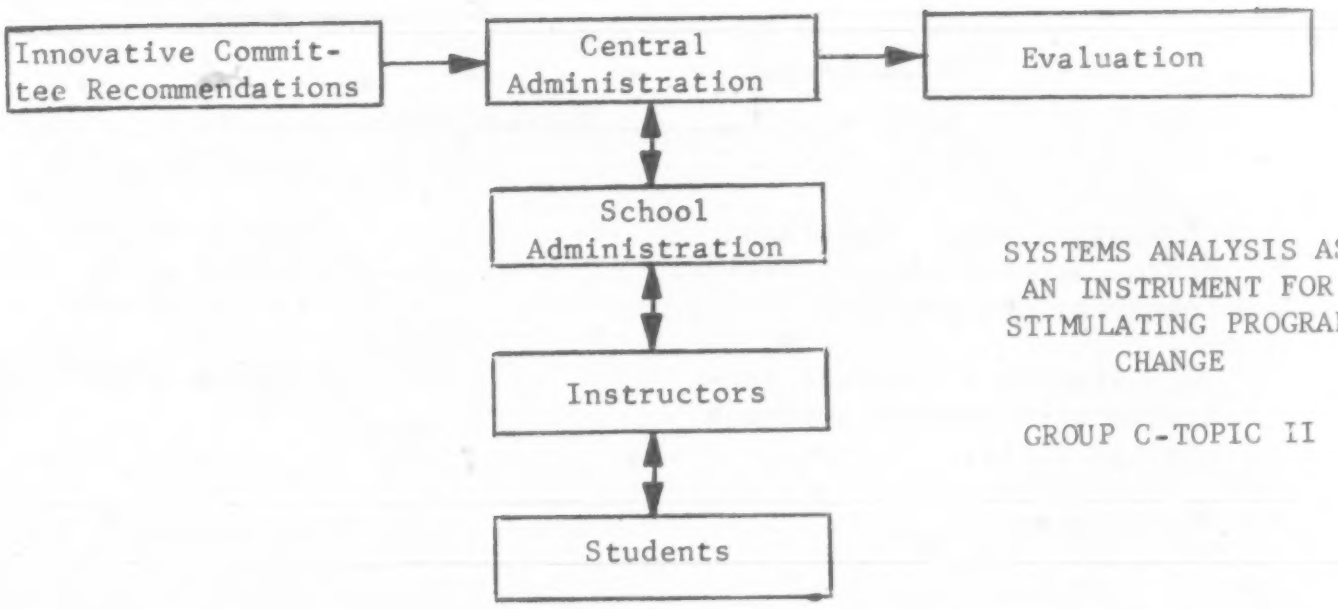
APPLYING SYSTEMS APPROACH TO CHANGE IN AN EDUCATIONAL SYSTEM

GROUP C-TOPIC II

CONSIDERATION



IMPLEMENTATION



SYSTEMS ANALYSIS AS AN INSTRUMENT FOR STIMULATING PROGRAM CHANGE

GROUP C-TOPIC II

SUMMARY OF PROCEEDINGS

SESSION III - INSTITUTE IX

INSTITUTE IX
III SESSION

LONG-RANGE PLANNING FOR VOCATIONAL EDUCATION

This session provided the participants with techniques and strategies to facilitate new ideas and concepts as a result of master planning. The Long-Range Planning techniques should provide educational leaders with procedures and guidelines for bringing about positive program change in Vocational Education in metropolitan areas. A topic included in this session was the establishing of alternatives and priorities that are an essential part of Long-Range Planning.

The participants were also provided with opportunity to review ideas and concepts that would be helpful in the development of models, flow charts, and/or guidelines for planning systems in Vocational Education. The groups were asked to consider present educational systems that might be utilized for improving the present operation of vocational programs. It must be understood that probably any system devised for Long-Range Planning will require modification and adjustments before a format emerges that will be ready for general use.

The following items must be considered by the individuals responsible for master planning in the educational sphere of operation. (This list is not complete, but should be considered as a guide that can be expanded).

1. The planning processes
    a. analysis
    b. decision-making

2. Types of planning
    a. policy planning
    b. work planning

3. Models and/or Systems

4. Conditions necessary for effective planning

5. Resources required

6. Educational organization and management structure

A Reaction Paper to
LONG-RANGE PLANNING IN
VOCATIONAL TECHNICAL EDUCATION
By Joseph F. Malinski

Prepared By

Dr. Melvin L. Barlow*

What's new about Long-Range Planning? Malinski says it is evolving, and in a very large sense he is correct. The specific situation is that VEA '63 made an issue of planning, and VEA '68 managed to get it in the law. Planning is no longer optional.

But planning as a fundamental of vocational education is not new--planning is one of the key foundation blocks of the total program of vocational education, and always has been. The fact that planning has not been used very well over the years is beside the point. I wish my assignment at this meeting had been to delineate the background of planning based upon the original thinking of the creators of the vocational movement in education. Their principles and concepts about planning are sound and they recognized the imperative necessity of planning--but legislation from 1917 to 1968 did not force the issue. I hope that our current efforts in Education Professional Development will continue to stress study, restudy, and interpretation of the foundations (principles) of vocational education.

About all I can do in this review is to agree with Malinski's paper--Joe needs to make no apologies whatsoever about his ideas.

Planning, considered under the two major classifications of "Analysis" and "Decision-Making", is certainly appropriate. However, final decisions cannot be made independent of program operation. It is not difficult to point to a number of rather "stupid" decisions from planning groups concerning program operation. By the same token program operators are prone to overlook many of the complexities of planning and frequently fail to take into account all of the factors which may affect program operation--such action limits the number of alternatives to be considered.

Malinski describes succinctly the transition of vocational education from 1917 to 1968. Let me add to his statement that the system of vocational education may be thought of as having three major parts: 1. Principles, 2. Interpretation, 3. Implementation. The system can be described

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University of California

briefly as: First, the principles of vocational education are sound and were determined during the period of 1906-1917--no new principles have been added, Second, because as society and technology change it is necessary to interpret these principles from time to time in the light of socio-economic complexities. This was done in 1917, 1929, 1934, 1936, 1946, 1963, and 1968, and it will be done again in future years. Third, upon the basis of new interpretations of principles that do not change we reach new conclusions about implementation, or making the program work. (1) Principles, (2) Interpretation, (3) Implementation. What we are concerned with now is that, long-range-planning is a wise selection of interpretation concepts and a judicious determination of implementation procedures. This analysis of the system of vocational education is my own and is based upon a thorough and prolonged study of the foundations of vocational education. To these basic elements in the system of vocational education we must apply the planning theory. You have already, or will, consider some of these theories.

Malinski's ideas of policy planning, work planning, and systems and real time are not in conflict with the views just presented. Malinski's ideas suggest the nature of the complex planning required. Meeting the vocational needs of people is not so simple now as it was in 1917. Had these ideas been suggested in 1917 they most certainly would not have been implemented because they would have been out of tune with the times. The implication that the ideas are in tune with contemporary requirements seems to be appropriate.

The 1968 Amendments, as Malinski reports, involves five goals:

- A single system of vocational education
- A coordinated vocational education program for all persons
- Provision for disadvantaged persons
- Provision for handicapped persons
- Preservice and inservice teacher education

The words identification, long-range-planning, designing, and installing emphasize objectives related to the goals. Too often in the past these goals and objectives (although identifiable in the foundation principles) are assigned to one person who simply cannot do justice to all even if he had the capacity to do so. The new vocational education program of the 70's must produce a new crop of vocational educators having a new variety of basic competencies. One of the reasons the sociology of vocational education has lagged is that many of us have had to assume a role of the sociologist and were not prepared to do so. The situation is equally bad to ask the competent sociologist to make applications to a system of vocational education that he does not understand. It is possible to have both.

My point is that the goals and objectives indicated by Malinski cannot be reached until we have a common bond of understanding about vocational education among the specialists from other disciplines. Otherwise the goals cannot be pursued, and the objectives cannot be reached. Probably this implies an entirely new and continuous program of inservice training for staff. Staff meetings usually do little or nothing toward education of staff for better basic understanding of the

total facets of a problem. Such meetings do much, however, in the way of acquainting the staff with administrative procedures. The element that is missing is an element of depth study. We simply must pull ourselves up by our bootstraps--and, it can be done.

Part III of Malinski's paper is concerned with the conditions necessary for effective planning. He discusses specifically the climate and the need for comparable information. I would like to add a word or two about each, but first an imperative condition necessary for effective planning which was not mentioned.

The first requirement is that the boss must have the desire to see that planning takes place and be wholeheartedly dedicated to planning as a means of achieving goals and objectives. A staff cannot do this unless real leadership is exhibited at the top. The boss cannot command that planning take place--this is not a matter he can legislate, direct, or order. He must approach the problem by providing an environment for effective planning--hopefully based upon his own reasonable knowledge and understanding of the problem involved in planning. In short, planning will not be effective if the boss sees it only as a requirement of the vocational education amendments of 1968. I would add to this requirement the additional necessity of open-mindedness!

About climate--a personal experience. It was my good fortune to have been involved with the panel of consultants of vocational education in 1962, and with the advisory council on vocational education in 1967. The ideas from the panel in '62 stressed service to people and flexibility. This was true also with the advisory council in '67. But during the five year period between 1962 and 1967 a great change had taken place in the nation. In 1962 no one had ever heard of Watts. Cleveland, Detroit, and Trenton were just names of cities, and student revolts had not reached the contemporary scene. By 1967 the nation was acutely conscious of the people who had fallen through the cracks in the social and educational structures, and an air of determination prevailed to right many wrongs. The council in 1967 approached its task in an emotion charged atmosphere the like of which we had never previously experienced. This is why the '68 amendments focuses attention upon the handicapped and the disadvantaged. This is why vocational education was expected to meet the needs of "all persons in all communities of the state," this is why the 68 amendments becomes a mandate to American education. This is why the aspect of flexibility is so apparent.

The climate is far more extensive than Malinski indicates. Projection data then becomes something more dynamic than proper statistical procedures.

The need for comparable information hardly needs any explanation at all. Over the years we have been comparing bits and pieces of information without complete control of the meaning of these basic elements of information. The problem has been one of playing a game in which no one is exactly sure of the rules. Malinski's description of the need for comparable information is far more sophisticated than I have just indicated, but the degree of sophistication Malinski is requiring is not possible without proper definition and interpretation of all of the little bits of information.

One of the dangers we bump into immediately is that thus far we are still perfecting the national system. Local and state systems may not, therefore, be able to provide comparable information at the present time to be used on a national basis. This situation is not hopeless and it will be resolved in time. Another inherent danger is to perfect the system to such a degree that we have too much information. I hope that as our information system evolves that somewhere we will have access to a descriptive portion. I have found it extremely difficult to describe the historical background of vocational education with only conjecture to add meaning to meagre statistical reports.

Actually Malinski sums up his key point in the statement, "In order to develop such a management document . . .It is essential that a common statistical and financial base be used." About all one can say here is, how true, how true.

Concerning Malinski's five implications I wish to comment about only two.

1. To change the emphasis from the process of education to the results in relation to need.

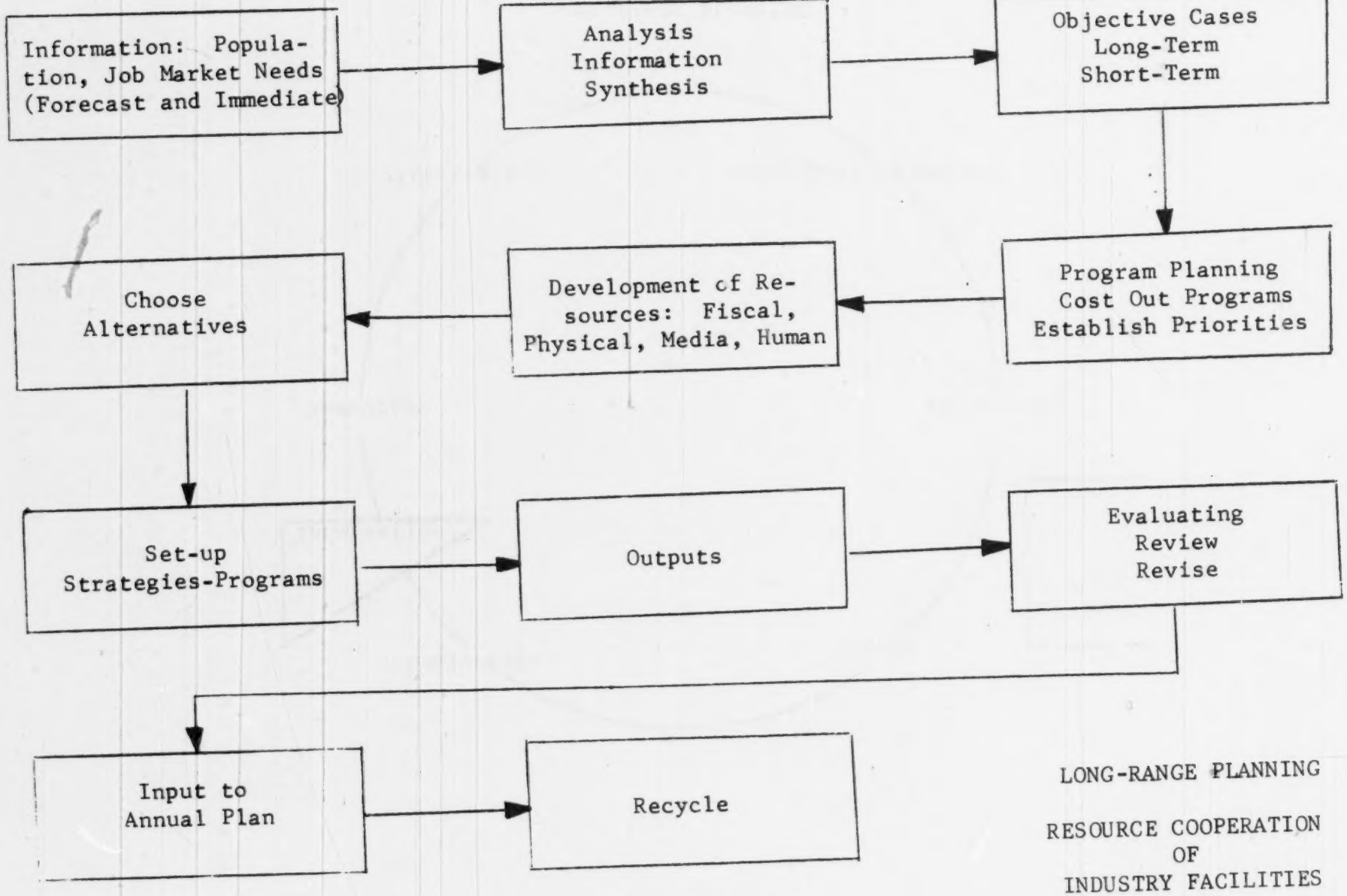
Malinski did not describe each of the implications so it is therefore difficult to be too critical because it is not possible to know exactly what he means. However, the word "from" gives me trouble. I doubt that a complete transition <u>from</u> process <u>to</u> results is justifiable. I do agree that results need strong emphasis.

A similar problem appears to be present in implication 3.

3. The separation of the management functions from instruction, and student service functions.

Again the troublesome word "from". I judge that Malinski's intentions are honorable, and I think that I know what he means, but such a separation can be carried out to ridiculous proportions. There can be no doubt, however, that instruction and student services need special emphasis.

My overall reaction to the Malinski paper is EXCELLENT. However, Joe can help us much if he will tell us more, in a succinct fashion, about his ideas. The germ of quality is present in his paper--we need more information before we can perform in concert.

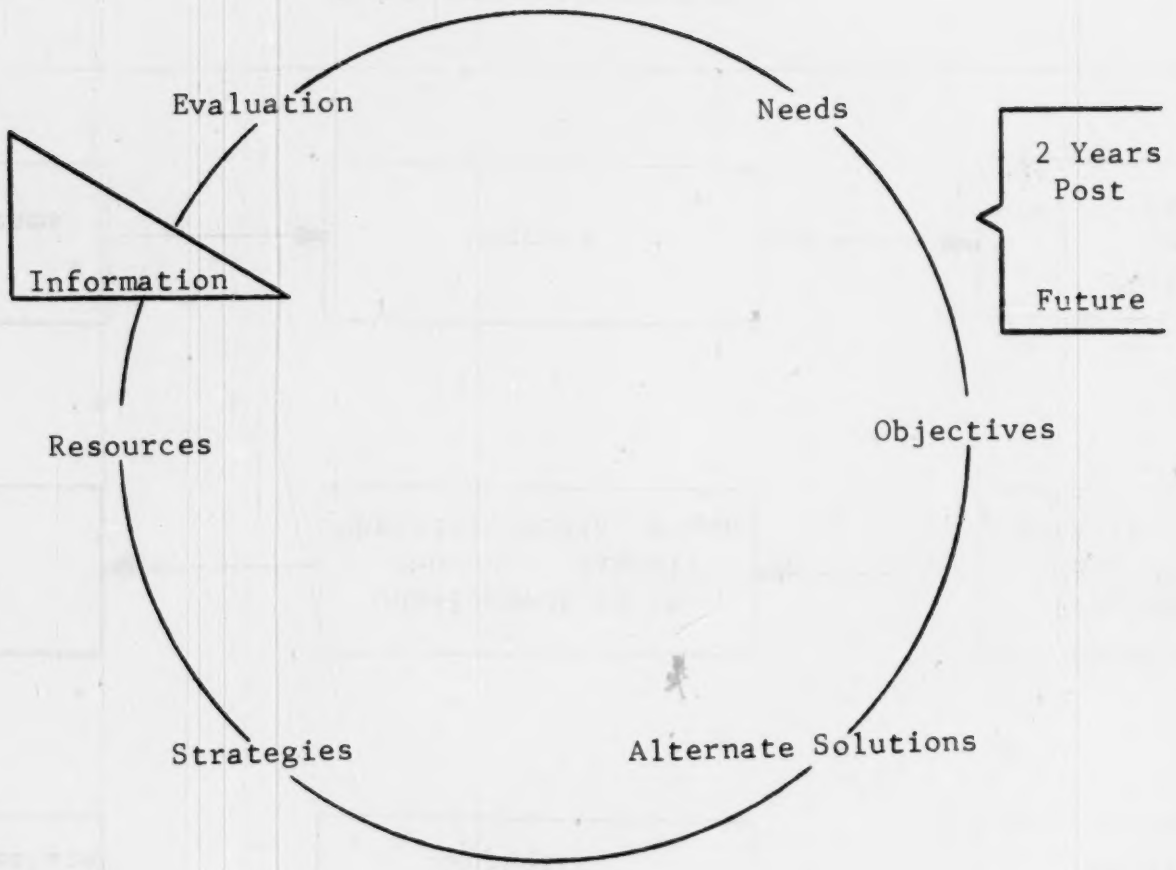


Input of Administration for Decisions

LONG-RANGE PLANNING

RESOURCE COOPERATION OF INDUSTRY FACILITIES

GROUP A-TOPIC III



LONG-RANGE PLANNING

GROUP A-TOPIC III

SUMMARY OF PROCEEDINGS

SESSION IV - INSTITUTE IX

INSTITUTE IX
IV SESSION

AN OVERVIEW FOR THE APPLICATION OF COMMUNITY RESOURCES RELATIVE TO SPECIFIC EDUCATIONAL NEEDS

A model or guide resulting from the Institute could set the stage for reviewing community rationale for allocation and commitment of resources (facilities, equipment, staff, finances), relative to the needs of all students.

The development of guidelines relative to what procedures should be taken to gain the greatest returns from community investments in special programs (vocational education, the disadvantaged, etc.) should encourage maximum utilization of limited resources.

The session did have a two-fold purpose:

(1) To develop a model which has the potential of facilitating a greater utilization of community resources in metropolitan areas.

(2) To develop guidelines intended to maximize the possibilities of engendering social action conducive to greater utilization of community resources as they pertain to vocational education.

A Reaction Paper to
AN OVERVIEW FOR THE APPLICATION OF
COMMUNITY RESOURCES RELATIVE TO
SPECIFIC EDUCATIONAL NEEDS
By A. P. Garbin

Prepared By

Dr. Walter J. Brooking*

Professor Garbin has prepared a thoughtful, general and theoretical presentation which addresses two proposals or propositions. The first is what he terms as a brief and embryonic model to insure greater use of community resources (personnel, equipment, facilities and money) by establishing a clearinghouse in a metropolitan community to serve the post secondary vocational and technical institutions in the functions of student recruitment, retention, placement, and follow-up.

The second proposal or proposition is an analysis, rationale and a "set of suggested guidelines outlining sequential steps to be followed in the instigation of planned social action leading to change in a community area."

Both of the proposals or propositions were presented as broadly conceived and generalized concepts. Each can provide a point of departure for researchers or administrators who must solve the problems of providing more and better vocational and technical education to all who can profit from it in metropolitan areas. Let us consider some aspects of each.

THE CLEARINGHOUSE

The model is limited to Post High School Vocational Technical Programs. Plausible sounding assumptions of function and benefit are advanced. However, the implications of student recruitment, retention, placement and follow-up encompasses almost the total service to students, hence directly or indirectly, almost all of the administrative and teaching or other services of the institution.

If the Model were to be tested, many important details would have to be incorporated or defined. Some important ones are:

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*Dr. Walter J. Brooking, Program Officer, Secondary, Post Secondary and Technical Education, Division of Vocational and Technical Education, U.S. Office of Education.

Who directs the Clearinghouse?
Who pays the salaries of the employees?
What criteria of accomplishment can be established by which the Clearinghouse Staff can be evaluated and motivated?
Where do the loyalities and hence the quality of the services of the Clearinghouse Staff lie?
What will the Clearinghouse cost, and how will its cost be equated with the present mode of operation in terms of cost effectiveness?
What relationship does the Clearinghouse function and establishment have to the administrative authorities who have responsibility for planning and accomplishing the total educational function in the metropolitan area?
Will the Clearinghouse become another beauracratic agency which divides the authority and responsibilities and blunts the initiative of individual school administrators and their staffs, and the municipal authorities charged with the task of providing viable, timely, high quality post high school vocational or technical education for all who can profit from it?
Could the Clearinghouse function be served by a loose consortion of the post high school institutions and other pertinent agencies where cooperation and mutual exchange of pertinent information and possibly sharing some functions could be accomplished without compromising the responsibilities of each institution?
When these and other parameters of the model are defined and the whole concept tested, is there a reasonable probability of its being useable as a model or plan to be initiated easily in other metropolitan areas, considering the variations of state, municipal and educational institutions from city to city?

These questions are not new to the researcher or administrator. However, this array of questions, and many others that would arise in undertaking to develop and test the model clearinghouse raises the overall question of cost in terms of research, institutional and other agency staffs, elapsed time required to get a useful answer, and narrowness of the field of inquiry compared to other approaches to provide more and better vocational and technical education to all who can profit from it in a metropolitan area.

THE SOCIAL ACTION (CHANGE) PROCESS

Professor Garbin's paper provides a well reasoned and scholarly discussion of the general concepts of initiating and accomplishing change, and provides a sequence of six steps which may be identified or must be accomplished to bring about a desired change. These are solid, though general, concepts which can be very useful methodological tools for the researcher or administrator seeking to enlarge or improve vocational education services in cities.

The first step "recognition of a need to more effectively use community resources to improve the vocational education program" requires, as Professor Garbin points out, documentation with records, data and surveys.

Step 2 is listed as "Identification of Relevant Organizations, leaders and factions." Professor Garbin clearly emphasizes the importance of broad representation of the community leaders of all major factions or groups in the city.

In his position paper Professor Garbin does not state who is taking the initiative to bring about change according to his six steps, but it is the sense of this conference that you who participate in this working conference and your counterparts in the nation are to be among the action initiators to provide more and better vocational and technical education in the nation's metropolitan areas.

The Vocational Education Act as amended in 1968 provides a special insight into the need for and validity of the first two steps described by Professor Garbin. Under Part A, a National Advisory Council on Vocational Education was created, and the creation of a State Advisory Council was made a requirement for each state which desires to receive a grant under the act. The composition of the National and State Advisory Councils was required to have the kind of broad community representation as Professor Garbin describes in Step 2. Further, under Part B, the act requires each state to provide a State Plan which is built up from local plans, and is based on the kinds of survey data and records indicated in Professor Garbin's Step 1.

The implications are clear that if advisory councils are necessary to serve the needs of change agents for vocational and technical education at the National and State levels, they also are needed in metropolitan areas. Urban populations and education are given priority in the provisions of how many funds are to be spent under the Act. It might be observed that the Congressional Committees which designed the amended Vocational Education Act of 1968 included the provision for advisory councils and more detailed state plans after extensive hearings and committee staff study of devices or organizational structures which held most promise for success in achieving needed changes.

Metropolitan populations, educational systems, and vocational education needs are a dynamic, constantly changing phenomenon. Those who are charged with providing relevant and high quality vocational and technical education to all who can profit from it in metropolitan areas are constantly involved in gathering data to assess the ever-changing status of the programs and needs.

It seems appropriate to suggest at this point that there may be considerable important information available in a metropolitan community which is germane and need not be redeveloped by additional research or survey efforts. The largest and most important single source of such information is in the practice and programs of the most successful existing public and private vocational and technical schools in the area. Each successful program represents a resource of research effort often largely undocumented, but validated by trial and error and experience.

This does not mean that all vocational and technical education which is provided in metropolitan areas is excellent, or even wholly satisfactory. However, the exemplary programs do have elements in them which often provide the best indication of the methodology and practice which can be replicated or expanded or extended. This is very important because most metropolitan areas usually have need for far more vocational and technical education than they now have. What works reasonably well in the community often holds greater promise of acceptance and use by modification to meet other needs in the same community than a wholly new effort.

The assessment of need and the identification of exemplary practice or needed directional change are included in Professor Garbin's first two steps. They are a continuing process. A single massive effort to determine needs and status at a given time may be needed if it has never been done thoroughly before; but it must constantly be updated. Such studies or surveying should and can be a cooperative effort of the entire concerned community, to provide the most significant indications or successful methodology to meet growing needs with dynamic and constructive change.

Professor Garbin's last four steps expand from the base of the first two by seeking the support of the key influential leaders and authorities in the community to endorse and promote proposed change, to inform the public about the need for and benefits from change, plan and organize to accomplish the change, and to involve the public broadly to provide the actions required to make the change.

APPLICABLE INFORMATION FROM OUTSIDE THE COMMUNITY

In step two the term "specialists" having "expertise" in the problem area appears in the list of important leaders or factions to be identified. In step five one of the three methods suggested for developing plans to accomplish the desired change is "hire an agency or firm to conduct a study and make recommendations." "Specialist" and "agency or firm--to study--" implies expert knowledge.

We suggest that the implications of "expert knowledge" in solving the problems of increasing vocational and technical education in metropolitan areas may well focus the attention of local persons functioning as change agents on the success or failure of various approaches, methods and programs to solve specific difficult inner city or other metropolitan vocational education problems in other cities. There are important sources of such information.

The researchers and administrators who are responsible and accountable for change toward more and better vocational education in the metropolitan areas might well actively search for dynamic leaders in programs in other cities who have solved problems and have exemplary programs. OEO, MDTA, NAB, and several other experimental kinds of approaches to the problems of improving education in the inner city or for persons who are unemployed and have special needs have produced important reports and programs which represent a large investment of public funds and professional effort in

down-to-earth research. It should be used to the fullest extent possible, on the assumption that there are probably very few serious problems in metropolitan vocational and technical education that have not been defined and already at least partially solved somewhere.

The studies and experimentation supported by private foundations for many years are another very significant source of information. A single example among many may illustrate the point:

The continuous experimentation for many years by the city of Flint, Michigan, in the development of the Community Centered School as a means of solving many of the most urgent metropolitan social and educational problems, assisted by many millions of dollars from the Mott Foundation represents a very significant source of information reflecting dynamic experimental programs over a period of many years. Leaders who have been or are still involved are sources of expert knowledge and opinion which should be used.

A final reaction to Professor Garbin's paper is to raise the question as to the kind of researcher or administrator required to obtain the needed growth in quantity and quality of vocational and technical education in the metropolitan areas of this great nation.

Above all it would seem that the leadership must be dynamic, involved activists. The increasing technological complication of the world of work, the increasing urbanization of the nation, and the fact that in many inner city areas with high unemployment and high percentage of academically, socioeconomically, or otherwise handicapped persons vocational or technical education is available to fewer persons than in suburban or rural areas brings a special urgency to the need for active and workable solutions to problems.

These solutions will not be as simple as those in the world of material things where an engineer can devise a machine that year after year will do the work formerly performed by human hands. The educational problems that must be solved are constantly changing. Because they are inherently human centered they will not likely be solved by a single narrowly defined model, tested in a simulated situation by researchers who have little involvement beyond the single problem they are studying.

To assist those who are responsible and accountable for improving and increasing vocational education in metropolitan areas the U.S. Office of Education, its National Center for Educational Research and Development, and the Bureau of Adult, Vocational and Technical Education offers all of the assistance it can provide - its publications, of which there are many, its research services and its Washington and Regional Office personnel. We hope all who are challenged to dynamic involvement in this problem may profit from such assistance as Professor Garbin's presentation and participation in working institutes or conferences similar to this one in their state or local metropolitan area.

A Reaction Paper to
AN OVERVIEW FOR THE APPLICATION OF
COMMUNITY RESOURCES RELATIVE TO
SPECIFIC EDUCATIONAL NEEDS
By A. P. Garbin

Prepared By

Dr. Robert L. Darcy*

These remarks have been given the title "Investing Community Resources in the Production of Human Capital" partly because this sounds more exciting than simply: "Reaction", and partly because it suggests that I want to assess Professor Garbin's paper within the conceptual framework of human resource economics. Economists, as you probably know, have a great many interests in common with vocational educators, even though this fact is sometimes clouded by differences in the way we approach our analysis of the processes and products of education. Indeed, such differences are what make multidisciplinary dialogues of this type as stimulating and productive as they sometimes prove to be.

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Since economics is the study of how society organizes to develop and use its human and physical resources, economists are naturally interested in the subject of "community resources". I shall shortly want to direct attention to three different concepts of community resources.

And since the main body of Professor Garbin's paper is focused on proposals for improving the way metropolitan communities organize to develop and use their resources, vis-a-vis vocational education -- the proposed clearinghouse and social action guidelines -- again, the subject matter is familiar and relevant to economists. If I may insert a personal note, all this is especially intriguing to me because of the particular teaching, writing, and research interests I have pursued during the past six or seven years. It was in 1964, in Ohio, that I first had the opportunity to link economic education with vocational education, guidance and counseling, and secondary school curriculum, all in the context of the manpower revolution.

These efforts began with a two-day, statewide conference on manpower development for educators (sponsored by the U.S. Department of Labor) and led eventually to a two-year curriculum development and research project (sponsored by the U.S. Office of Education) -- the evaluation, dissemination, and further development of which has occupied much of my energy during the past four years. The one-semester high school course in "Manpower and Economic Education" that emerged from that project currently is being used in some 50 school systems throughout the country, mostly east of the Mississippi River. My colleague, Phillip Powell, and I feel that the course

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represents an additional community resource available to assist vocational educators in helping young people prepare for successful participation in the world of work.[1]

I said I wanted to discuss the concept of community resources, but before doing so, let me suggest why this seems necessary, and at the same time identify some points of my confusion or disagreement with Professor Garbin's paper.

First, Professor Garbin states the need for vocational education (p. 1) and tells us that the purpose of his paper is to describe a model that can "insure greater use of community resources and improve the effectiveness of the vocational education program". But he doesn't explain which community resources he has in mind -- General, Type S, Type G, as I shall call them. Nor does he develop any rationale to support the particular strategy for improving vocational education that he proceeds to describe, namely a clearinghouse to increase and/or better utilize "community resources".

Second, he indicates a special interest in programs at the post-secondary level and asserts that his proposed clearinghouse model is "directed toward the post-high level" -- partly because of its growth potential, and partly because "the available resources which exist to support this level of education are frequently not effectively utilized". (p. 2) It is not clear to me, after studying the overview presented in this paper, how the proposed clearinghouse has any greater relevance to post-secondary education than high school programs, except perhaps when it comes to recruitment of students. Regarding the charge of inefficiency, it is not clear whether he means that Type-S resources are often misused or that Type-G resources are not effectively used.

Third, a further purpose of the paper involves suggesting some guidelines for a social action process, which we are told "do not refer to the proposed model", (p.3) a disclaimer that is somewhat confusing in view of the fact that the social action guidelines -- an important contribution of the paper -- do indeed have a great deal of relevance to the clearinghouse model. They suffer from a lack of specificity, but this could very easily be overcome in an expanded paper.

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Professor Garbin identifies community resources (p.1) as "personnel, equipment, facilities, money". In the context of vocational education -- or economic education for that matter -- he is no doubt referring to those resources which are external to the vocational education system per se but

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1 Manpower & Economic Education, by Robert L. Darcy and Phillip E. Powell, 1968. Joint Council on Economic Education, 1212 Avenue of the Americas, New York 10036.

potentially available to the system for purposes of "enrichment". Resources, as defined by economists, refer to all things which can be used in production. Resources can be used to produce either consumer goods or capital, the latter including both physical capital (e.g., a factory building) and human capital (e.g., a stock of education, measured as so many years of schooling, or as observable skill capabilities and knowledge).

Every community has certain resources available to it. The total stock of capital, the quantity of natural resources, and the work potential of the labor force make up the community's resource base. Along with technology (the state of the industrial arts) and the institutional structure (the way society is organized) it is resources that set the upper limit to what the community can produce. That is the most general concept of resources. Whatever success vocational education has in producing human capital -- adding to the stock of knowledge and skills that enhance the productive capabilities of men and women, in whom the capital is embodied--depends on the quantity and quality of available resources and the way these resources are used within the technological-institutional setting.

At the other extreme is the specialized concept of resources, i.e., the package of specialized manpower, capital, and natural resources allocated by the community for a particular productive function, such as helping to develop qualitatively superior human resources via the investment process known as vocational-technical education. This concept of community resources, which we can call Type-S, is merely a subset of the community's aggregate resource base.

The third concept of community resources moves us into a grey area: it includes that part of the community's total resource base that is not specifically allocated to the production of vocational-technical education but nevertheless has the capability of contributing to that end as a secondary or spillover effect -- if the community's institutions are structured in such a way as to channel these resources effectively into productive uses. We can call these Type-G resources, and they are presumably the ones that are to be more effectively utilized by establishment of a clearinghouse. Examples might include: people, equipment, and facilities from the State Employment Service, the Chamber of Commerce, industry, labor unions, universities, service clubs, community action groups, recent post-secondary school graduates, etc.

In looking at these Type-G community resources, let's assume -- as Professor Garbin had done -- that the "personnel, equipment, facilities, money" are not already fully and efficiently employed elsewhere; lets think of these community resources as being available virtually as "free goods", waiting as it were for the vocational education system to get its hands on them. We are then ready to address our attention to the means which are proposed to accomplish this end. The "means" are the clearinghouse and the social action process.

Let me emphasize that this "free good" assumption might be one point at which the clearinghouse proposal is vulnerable. In arguing the case for establishment of a clearinghouse the proponents should be aware that --to borrow a line from economist - author Leonard Silk -- "in the great cafeteria of education, there is no such thing as a free lunch". Attracting community

resources into a clearinghouse program may very well entail shifting Type-G resources away from other employment, with a resulting opportunity cost (i.e., sacrificing whatever goods or services were being produced by the resources before they were reallocated). Of course, if the community resources absorbed into the clearinghouse were not previously employed, real costs are nil; but to test the realism of this assumption, you might ask yourself: How effective are amateurs in operating programs as complex as the one proposed?

The purpose of the clearinghouse is to alleviate student problems related to recruitment (enrollment in the post-secondary vocational programs), retention (in school), placement (on the job, after schooling ends), and follow-up (on the job.) These four problem areas might include such activities as testing, guidance and counseling, orientation to the broader world of work and economic system, motivational experiences, attitudinal stimulation, career planning, job development, post-placement job coaching, employee and job evaluation, and the other services and research questions associated with vocational success.

Time, fortunately for us all, does not permit me to comment on every feature of the clearinghouse model and social action process -- though temptation is strong in some instances, based on experiences I have had working with "interstitial groups", both within the establishment and outside the establishment.* Communication, coordination, cooperation are reasonable and highly functional principles on which to base a system for delivering manpower services (such as recruitment, vocational training, and job placement); but independence, suspicion, rivalries, hostility, inexperience, limited skills, the desire to "take care of our own people in our own way", and similar factors endemic to the real world will intrude on rational models.

Professor Garbin is aware of these problems, pointing out, for example, (p.7) that groups tend to work independently and competitively. These tendencies can indeed be overcome, as he suggests, by means of an integrated and exhaustive system of communication, cooperation and organization". But that is just the problem: How to establish such a system? The paper suggests that "costs incurred by a wholistic approach on the metropolitan level would be cheaper than the many individualistic attempts".

My efficiency-minded economics students tell me the same thing. But there are at least two shortcomings in that sort of implied benefit-cost analysis: first, it overlooks some of the benefits accruing from

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*The former include Economic Education Councils (made up of school and university people, businessmen, labor and farm leaders, bankers, etc.); the JOBS Program (National Alliance of Businessmen, labor unions, government manpower agencies); Metropolitan CAMPS Committees. The non-establishment groups include civil rights, anti-poverty, and job programs, illustrated in Denver by such organizations as Denver Opportunity, Project Concern, Concentrated Employment Program, LARASA, the Urban League, SER, Call of the Council Drums, NAACP, Model Cities, etc.

"individualistic attempts" (such as the production of valuable human capital, in the form of leadership and other social-action skills, embodied in the paraprofessionals and others who gain experience through operating the various programs); and second, the cost estimates -- already understated because of the "free goods" illusion -- may not be relevant at all if the obstacles are so serious as to actually prevent establishment of a comprehensive, centralized, coordinated, efficient structure.*

In concluding, let me say that I am impressed with the benefits that could accrue from a clearinghouse program but have reservations about the feasibility and the efficiency of such a project. I commend Professor Garbin for the emphasis which he places on social action processes -- guidelines for involving community groups and individuals in planning, public information, implementation, follow-up, etc. Indeed this whole area of procedures for bringing about institutional adjustment to meet important human needs is precisely where social scientists and educators will have to begin making greater contributions to the communities they serve. For it is so often true that we can agree on the desirability of a goal -- such as the establishment of a Metropolitan Manpower Clearinghouse -- but specifically how to accomplish the goal, in the face of so many obstacles and competing demands for resources, is frequently a much more difficult challenge.

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*I am acquainted with some limited clearinghouse-type programs that have enjoyed limited success, though not without heavy investments of community resources. The Cleveland, Ohio schools, for example, operated a job-placement program for their dropouts and graduates, employing "without cost", among other resources, a $15,000-a-year personnel executive on loan from industry. Detroit, Memphis, and other cities have developed similar Volunteer Placement Corps programs, relying heavily on "free" manpower. I have heard school people say -- and Employment Service staff also -- that they could do the job far more effectively if they were given full control of the resources or their dollar equivalents.

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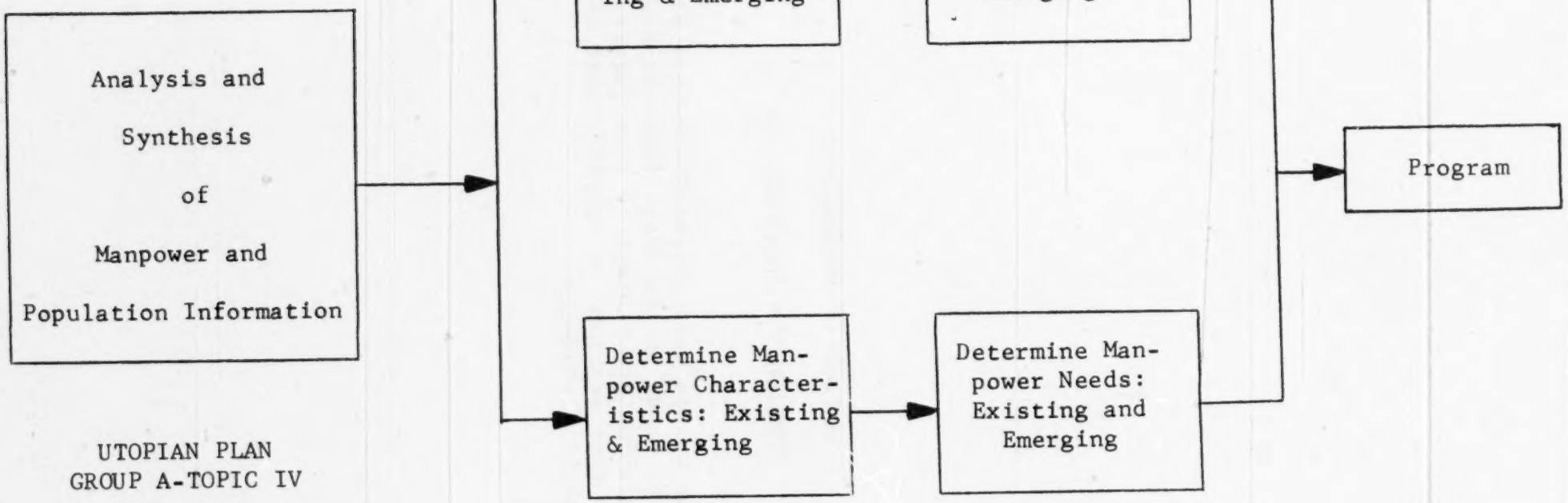
Analysis and Synthesis of Manpower and Population Information
Determine Population Characteristics: Existing & Emerging
Determine Population Needs: Existing and Emerging
Program
Determine Manpower Characteristics: Existing & Emerging
Determine Manpower Needs: Existing and Emerging

UTOPIAN PLAN
GROUP A-TOPIC IV

SUMMARY OF PROCEEDINGS

SESSION V - INSTITUTE IX

(No reaction papers were prepared for this session as the author of the paper on the topic lead the discussion. There was also no group prepared flow charts or models prepared at this session. A complete text of the authors presentation is included.)

USING THE DELPHI TECHNIQUE AND SIMULATION EXERCISES IN IMPLEMENTING PLANNED PROGRAM CHANGE IN VOCATIONAL EDUCATION

By

Dr. Donald Anderson*

The scope and content of this paper has been changed from that originally assigned. When the Institute director contacted me earlier this year, he asked if I would present a paper entitled "Simulation Exercises and Their Implication for Implementing Planned Program Change in Vocational Education." In later conversations, we agreed to alter the focus by expanding it to include other than just simulation. The paper might well be entitled "Old Wine in New Bottles" or more appropriately "Using Old Tools in a New Way to Perform a Much Needed Task."

The approach will be that of describing techniques from the vantage point of a practitioner. Most of this paper consists of descriptions of activities that I have been engaged in as a person having some responsibility for planning within a College of Education in a very large university. Inasmuch as possible, examples relating to vocational education are provided.

Instead of dealing exclusively with simulation, a portion of the paper will deal with the utilization of Delphi Technique in planning efforts. While these two techniques might seem to be unrelated, I will attempt to show how both can be useful in the planning process.

The concept which is paramount in this paper and to this institute is that of planned program change. This is the era of planning and futures projection. If we were to look at the titles of conferences being held all over the country for the past couple of years (and probably for a few years to come), one would note an extraordinary emphasis upon words such as "planning" or "change." I need not document that fact, I expect, because I am speaking to a group of convention attenders and program planners. Nor need I document some of the reasons for this kind of emphasis. Technological and sociological phenomena are forcing out educational systems to behave in manners which bring about this kind of emphasis in conferences and conventions.

In that the emphasis is on planning, it would seem appropriate to define planning and to identify some of the steps that I see in this planning process. Planning is much more than trying to predict what is going to happen in the future. Such prediction might better be left to fortune-tellers. The intelligent man not only tries to anticipate the future but indeed attempts to control it. The process of so doing, we refer to as planning. It is difficult and probably foolhardy to attempt

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to make clear distinctions between planning and decision-making. Planning obviously is part of the decision-making process as is decision-making part of the planning process. One difference sometimes noted is that in planning, the emphasis is on the future. It's something we attempt to do prior to the time we must take action. That is, it is anticipatory decision-making. Ackoff defines planning as "a process that is directed toward producing one or most future states which are desired and which are not expected to occur unless something is done."[1]

The steps in this planning process might be broken out as follows: (1) appraising the future political, economic, and social environment; (2) ascertaining the desired role of the individual or organization (as the case may be) in this environment; (3) anticipating and perceiving the needs and requirements of the client groups of the organization or individual; (4) setting up a system of communication and information flow so that members of the organization can participate in this planning process; (5) developing the broad goals, objectives and plans which will direct the efforts of the total organization; (6) translating this broad, general planning into some functional efforts on a more detailed basis as, for example, instruction, service, or development; (7) developing the more detailed planning and control of resource allocation within each of these areas -- in other words, programming the effort by assigning personnel and other resources to activities.

The Delphi Technique

A Description of the Technique. The Delphi Technique is an approach that can be used in the planning process especially in that part of the process having to do with appraising the future political, economic, and social environment; ascertaining the role of the organization in this environment; and anticipating and perceiving the needs and requirements of client groups.

The Delphi Technique was developed by Olaf Helmer and his colleagues at Rand Corporation in the early 1950's to obtain group opinions about urgent defense problems. About five years ago, an unclassified description of the technique was published and the procedure is being employed presently in a number of settings, including education.

The technique, which is built on the strength of informed intuitive judgement, is intended to get expert opinion without bringing the experts together in any kind of a face-to-face confrontation. Contact is generally made with the experts through successive questionnaires and feedback with each round of questions being designed to produce more carefully considered group opinions. Pfeiffer presents the following variation of the procedure.[2]

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1. Russel L. Ackoff, A Concept of Corporate Planning (New York: Wiley-Interscience, 1969), p. 3.

2. John Pfeiffer, New Look at Education (Poughkeepsie, NY: Odyssey Press, 1968), pp. 152-157.

1. The first questionnaire may call for a list of opinions involving experienced judgement, say a list of predictions or recommended activities.

2. On the second round, each expert receives a copy of the list and is asked to rate or evaluate each item by some such criterion as importance, probability of success, and so on.

3. The third questionnaire includes the list and the ratings, indicates the consensus, if any, and in effect asks the experts either to revise their opinions or else to specify their reasons for remaining outside the consensus.

4. The fourth questionnaire includes list, ratings, and consensus and minority opinions. It provides the final chance for revision of opinions.

While the procedure has been used extensively in predicting long-range developments in defense, automation, space research and other scientific-technological areas, it can also be used to advantage to encourage convergence of opinion or at least a majority opinion and a clearly-defended minority opinion as a basis for predicting long-range developments in education and formulating goals and setting priorities.

I see two possible ways in which use of the Technique might profit those of you who have responsibility for planning vocational education programs. The first is much like that originally suggested by Helmar and his colleagues and follows the pattern of the Pfeiffer variation which I have just delineated. The second has to do with setting goals and priorities on programs.

Predicting Future Events in Education. In the first case, vocational education is an area which is subject to a dramatic change because of the rapidly changing technology. Because there is some basis for predicting this change in technology, it would appear that you have much to gain from the use of the Technique in planning for the future. Let me illustrate. The first step in the Delphi would call for a panel of experts being asked to generate a number of predictions about the future which would have impact on vocational education. Such a list might include statements such as the following:

Developments[3]

1. Weather and climate control will increase the agricultural production of the State of Jefferson by fifty percent.

2. The length of the work week for at least half of the blue collar workers in Jefferson will be 25 hours or less.

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3. These examples are very different and normally would not appear on the same questionnaire.

3. Ninety-five percent of all children in Jefferson will complete at least fourteen years of schooling.

4. No one in the State of Jefferson shall be more than 30 miles (45 minutes) from a vocational-technical school offering instruction in at least six engineering technology programs and six business and health related occupation programs.

5. It will be possible to exercise genetic control or influence over the "basic constitution" of an individual.

The examples may not be very good and they certainly are of a different order, but they do illustrate some of the future developments impacting on the area of vocational education. After generation of such a list and as step two in the Delphi, the experts would be asked to predict the date at which these events might occur. It is likely some experts may respond that a particular event or development would never occur. The experts would then be asked to send these predictions back to the person responsible for the collation and feedback. On receipt of these data, the person managing the Delphi would calculate some kind of consensus statistic. In most cases in which the Delphi has been used in this manner, the statistic used has been the inter-quartile range. In other words, the Delphi manager would calculate the 25th and 75th percentiles of those dates predicted and record those dates.

In round three of the Delphi, the experts would receive an instrument such as the following:

Questionnaire #3

Development	Your Previous Estimate	Consensus Estimate (IQR)	Your New Estimate	Reason Your Estimate is Below or Above IQR
1. Weather and climate control will increase the agricultural production of the state of Jefferson by fifty percent.				

Respondents are now asked to give a new estimate of the date at which the development will occur in light of new data, that being estimates coming from other experts. It is particularly important at this stage to call on experts to use their experience and knowledge and not be coerced to join the consensus group. As you will note, they are given opportunity and should be encouraged to provide reasons based on their own expertise why their estimate is either above or below the inter-quartile range. Once again, the questionnaires are returned to the Delphi manager and inter-quartile ranges are recalculated.

Round four of the Delphi calls for sharing with each expert his most recently estimated date for each development, the recalculated inter-quartile range, and the list of reasons offered by all experts for choosing dates outside the range. Unlike committee meetings or other personal confrontations, the strength of the argument, not the personality or status of the person making the argument, is the single most important influencing agent. In this round, if experts do not agree with the consensus, they are asked to challenge the arguments given in favor of the opposite end of the inter-quartile range from their own. (If an expert's estimate is on the high side of the IQR, he is asked to refute the low estimate.) The Delphi Technique can go through a number of rounds similar to round four, but generally five or six is adequate.

A slight modification of the Delphi which relates to the concept of planning as anticipating and attempting to control the future is as follows: Experts are asked early in the process to make a value judgement as to whether or not the development is "good" or "bad." Assuming that a large number of experts feel that a certain development is "bad," they are asked to identify the kinds of policy decisions which would slow down or hinder the development or event. Conversely, if the development were considered to be very desirable on the part of the experts, they would be asked to identify strategies or decisions by which the development might be accelerated. As one might expect, there will be developments where one will get some marked splits in opinion regarding desirability; the example regarding genetic control on influence over the basic constitution of the individual might well be such a case.

Using the Delphi Technique and the results obtained from others who have used it in this manner seems extraordinarily fitting to those persons working in vocational education.[4]

Setting Goals and Priorities. Yet another use that can be made of the Delphi is that of generating goals, objectives, or target conditions, and setting priorities on those targets. It is in this area that we have used the technique extensively in the OSU College of Education and in the county school systems in the state. The first round involves the generation of the objectives or target conditions. After experimenting a great deal, we have used rather successfully a sentence such as the following to generate that first set of conditions:

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4. Personnel at the Education Policy Research Center at Syracuse University have made extensive use of the Delphi Technique in their work.

During the decade ahead, the Jefferson State Division of Vocational Education should concentrate its energies and resources on . . .

Respondents or experts are asked to provide six to ten endings to that sentence. After testing a number of different kinds of "generating" sentences, we found it important to focus upon energies and resources, both of which are basic to priority setting. Once those items come in, the task of the person responsible for managing the Delphi becomes a very crucial one. It is difficult but not impossible to synthesize the diverse kinds of responses that come to this kind of an open-ended question. After having worked with large numbers of experts in a couple of different settings, we have found it to be best for three or four people to synthesize these results independent of one another. Their efforts can then be brought together to prepare for the next round. In the second questionnaire, participants are asked to indicate priorities they would attach to those target conditions. An example follows:

Questionnaire #2

After each of the statements, indicate the priority you would attach to the target condition using the following key:

1. Top priority
2. Second priority
3. Maintain at present level
4. Reduce or discontinue activity or service -- do not initiate activity in this area.

In order to face up the reality of scarce resources, you must distribute your priority rankings in such a manner that you will have an equal number of 1's, 2's, 3's, and 4's.

During the decade ahead, the Jefferson State Division of Vocational Education should concentrate its energies and resources on:[5]

1. Assisting vocational schools in the assessment of existing and experimental programs.

2. Conducting vocational-technical education needs assessment in the State.

3. Providing in-service opportunities for the State's vocational-technical school teachers.

4. Doubling the number of vocational-technical teaching stations in Jefferson.

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5. Some of these statements are of a different nature and normally would not appear on the same questionnaire.

5. Improving internal communications (within the Division and within the Jefferson State Department of Education).

6. Providing services, i.e. centralized purchasing and accounting, to the State's Vocational-Technical Schools in order to increase their efficiency.

Once the results are in, the Delphi manager calculates the consensus statistic. We have used the mode and a weighted mean for that statistic and found the latter to be far superior. Much as in the earlier example cited, the expert is then asked to respond as follows:

Questionnaire #3

Accompanying each of the statements are (a) your previous response, (b) the consensus response, (c) spaces to record your new response, and (d) the reasons for the variation between your new response from the consensus response, if indeed there is a variation.

During the decade ahead, the Jefferson State Division of Vocational Education should concentrate its energies and resources on:

Statement (a)	Your Previous Response (b)	Consensus Response (c)	Your New Response (d)	Reason for Variation Between c & d
1. Assisting vocational schools in the assessment of existing and experimental programs.				

Experts are provided their previous response, consensus response of the group and are asked to make a new response. Any variation between the consensus response and their new response is to be justified. Just as in the previous example of Delphi Technique utilization, it is extremely important that participants be urged to use their expertise in citing reasons for any variation between the consensus response and their new response.

Round four is much the same as round three with the exception that experts are provided a listing of arguments for assigning priorities

higher or lower than the group priority ranking. These arguments are to be taken into consideration in making the new response. As before, this can be run through a number of cycles, each one from this point being much the same.

In addition to providing data for making priority decisions, this use of the Technique provides the participants with some firsthand experience with the problems of resource allocation. One of the major problems in this kind of goal setting exercise is that of identifying the expert group. It is very tempting to include in this group all who are influenced substantially or who can make a significant and/or unique contribution to the resolution of the problem. Once the number of experts gets beyond 25 or 30, handling the data (especially the arguments advanced) becomes exceedingly cumbersome. We have had some good experience using two-man teams of experts as a solution to the numbers problem.

There are many other possible uses of the Delphi which might be relevant to your work. As an example, one of our Ph.D. students is currently using the Technique to identify competencies needed by personnel employed in program planning in state divisions of vocational-technical education.

Simulation

Description of Simulation. The word simulate is derived from the Latin word simulatus, which means to represent, imitate, or feign. A dictionary definition of simulation is that of having the experience or characteristic or effect of whatever is being simulated. Some writers define simulation as a dynamic representation achieved by building a model and moving it through time. This definition is especially appropriate for those dealing with mathematical modeling and computer models. Simulation is in common use today. All of us have had experience watching simulations of space flight or moon landings in the last year. The concept of simulation is as old as some of the early Greek and Roman war games. War strategists have used simulation regularly in their endeavors over this entire period of time. The kind of simulation dealing with management, gaming and instruction has become increasingly popular since the mid-1950's.

There are many ways of classifying simulations, one being by degree of abstraction. In this classification, one extreme would be the case where a real system itself was used as a model to gain knowledge about itself; the other end of that continuum is a complete analytical simulation wherein the real system is represented by some kind of a mathematical model. Another way of classifying simulations is by their objective or use. They might be used, for example, as evaluation or research tools, as teaching, training or instructional devices, or as demonstrations. Another common classification is by the degree of human involvement. Categories in this classification might include (1) human simulations (man-man simulations) such as role playing or some business games; (2) mixed man-machine simulation such as

micro-teaching or those used frequently in business and military gaming; and (3) machine simulations such as that used in computer problem-solving behavior or artificial intelligence. Another classification is that by the type and amount of simulated materials used. Categories range from the saturation approach in which the person engaged in simulation receives a great amount of information to micro-simulations where there is a much smaller amount of data available to the person engaged in simulation activity and, finally, to the non-material based simulation where persons are placed in situations much the same as they experience in the real world.

There are two strategies that I would like to make reference to in which simulation might be used in planning program change. They are modeling the system and tooling up for planning.

Modeling the System. Modeling the system is a very complicated endeavor in any system that is as complex as an educational organization. In attempting to develop a model for a given system, Schmidt and Taylor suggest that there are three possible cases.

1. The system is amenable to both description and analysis by a mathematical model.

2. The system is amenable to description by a mathematical model. However, correct analysis of the model is beyond the level of mathematical sophistication of the analyst.

3. The system is so complex that description of the system by a mathematical model is beyond the capabilities of the analyst.[7]

In the absence of a mathematical model, it is possible for cases two and three to lend themselves to simulation for solution. Simulation of this nature is a very technical endeavor and will not be discussed in any detail in this paper primarily because of the lack of expertise on the part of the writer. In simulations of this nature, the model of the system which is created may be employed as often as desired to analyze different situations. These simulation methods are useful for analyzing proposed systems in which information is incomplete. Usually the data for further analysis can be obtained from a simulation model much more cheaply than it can be from a real world system. There are some problems in this utilization of simulation including the fact that the simulations are very costly to construct and to validate. Normally these simulations require a computer system and may, in fact, involve a good deal of computer time which is also costly. The most serious disadvantage, however, is directed more toward people than technique. The number of persons skillful in creating and utilizing such simulations is limited.

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7. J. W. Schmidt and R. E. Taylor, Simulation and Analyses of Industrial Systems (Homewood, Illinois: Richard D. Irwin, Inc., 1970), p. 5.

There are a number of instances where this kind of system simulation has been used to advantage. Some of the work done by those in the fields of industrial engineering and business administration can be useful to those of us working in education. We can, for example, simulate some of the subsystems of an educational enterprise. In this kind of simulation, the primary purpose might well be that of achieving the most effective allocation of available resources over a period of time. The plans might be designed around program elements and the related sources impacts rather than around any kind of object classifications. For example, student enrollment by major academic field generates a demand for instruction within each subject category. Instructional demand by category along with maximum class size restrictions generates faculty teaching loads by faculty skill and determines classroom and laboratory facility utilization. All of these activities together with tuition and scholarship rates, faculty salary structure, and operating expense relationships affect the source and uses of funds.

In creating this kind of simulation, a model of the system must be designed and those variable which are key to the system must be identified. If our concern is providing some kind of a particular service for students, as for example health services, we must identify the kind of variables that will affect that health service operation and the kind of output that is expected. To be included as input variable might be numbers of students, numbers of visits per quarter per year, numbers of stations necessary to accommodate that particular service, numbers of personnel associated and time.

In the area of vocational education it would appear that this use of simulation would be particularly apt. As an example of such utilization, let us assume that there is identified an urgent need for laboratory assistants to work in secondary school science classrooms in the state. If the state's vocational education program is charged with responding to that demand, we might well create some kind of a model of a system which would have as its output trained laboratory assistants. In this hypothetical situation, our charge spells out the kind of skills expected of the product and we are to test alternative training strategies for accomplishing the task at hand. One possible training strategy might be that of providing a correspondence course supplemented by laboratory sessions over a period of 18 months. Another possible strategy would be that of bringing the students in for a very extensive program of eight weeks duration at the conclusion of which they would be given certificates. Obviously, there are an indefinite number of strategies which might be designed. For those which appear to be most suitable, we might simulate the training programs identifying key input variables, testing the model using different inputs and examining the effectiveness and efficiency of each strategy.

A more common form of simulation that youve heard about earlier in the week is that of management modeling. An example of such management modeling is the use of PERT or CPM. These are in reality attempts to model activities. They are dealing with abstractions, assessing the order in which activities must take place, and assigning reasonable time limits on these activities.

A rather unsophisticated attempt at modeling a system was made recently by a few of us in the college with a fair degree of success. Faced with a major reorganization of the University, each college was asked to reexamine its own structure. College leaders wanted to insure as best they could that the way faculty groups (production units) were organized and the mechanisms set up to govern the college would facilitate the process of planning, evaluation, and production.[8] There was great concern for utilizing scarce resources to best advantage and for increasing the college's potential to cope with the challenges of today's world as well as shape the world of tomorrow. This obviously called for an organization which would facilitate planning and evaluation in the college.

Faced with such a charge, two advocate teams were charged with defining and describing such organizational schemes. The product of these efforts was three "model" organizations. Once this task was accomplished another team charged with evaluating the models chose simulation as the major evaluation strategy. An elaborate set of simulation materials was developed and all the faculty members and administrators plus the key staff members took part in the simulation exercises.

Different "problems" calling for planning and maintenance decisions were fed in to the models. All participants played roles in the simulations and on conclusion of each exercise were asked to evaluate the model. From that experience, there evolved a model for organizing the faculty units and the governance structure of the college. Since that time, I have had similar success experiences using simulation in this manner in a small department of education in one of the New York State universities and in two county school systems in Ohio.

To translate this experience to your field, let us assume that a State Department of Education is contemplating reorganization and that one of the chief concerns is that of improving its planning capability. A number of alternative models might be generated. For example, one possible model might call for all planning personnel being in a staff position to the State Superintendent; another might call for planning personnel to be housed organizationally in subdivisions of the Department. These or other possible models might easily be tested by designing simulations and feeding planning demands into the models. Utilizing simulation in this manner has another distinct advantage. It forces persons who eventually are going to play roles in the organization to study and evaluate alternative models in advance of adoption rather than just accepting a model designed by someone else.

Tooling Up For Planning. A second manner in which simulation can be used in the program planning endeavor is to tool up a staff so that it is ready to take on this task. It is in this area that we in education have begun to make rapid advancement in the last decade. In the 1950's, the

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8. Production in the College is defined as knowledge generation, synthesis, dissemination, and utilization.

simulation technique became very prominent in a number of management training programs. The technique found its way in the preparation programs in education through the research route. In the mid-1950's, personnel at the Educational Testing Service (ETS) were involved in a test construction process designed to evaluate the effects of instruction in a Command and Staff School of the Air University. Air University administrators were interested in designing an instrument to test the effectiveness of their instructional efforts. Representatives of ETS worked with them in developing an instrument called the "in-basket test", a situational test presented in written form administered to the group. The testing involved responding to some in-basket items containing letters and memoranda. Participants were asked to respond as if they were actually playing a role. They were given some experiences much like those which they would face on the job.

A short time later, the personnel at ETS developed a business in-basket test used primarily by American Telephone and Telegraph Companies in their middle management program. It was picked up and used by a number of other companies. In 1957, The Cooperative Research Branch of the U.S. Office of Education made a $250,000 grant for a study entitled "The Determination of the Criteria of Success in Educational Administration." [9] Although the major objective of the project was to achieve better descriptions and explanations of selected administrative behaviors of selected principals, another objective was to produce simulated situations and problems which could be used for instructing prospective educational leaders.

Following a number of additions and revisions of these materials, a team at the University of Nebraska designed some simulation materials which are intended to provide general educational administrators with an awareness and appreciation of vocational educational programs.[10]

My colleagues in the Center for Vocational and Technical Education at the Ohio State University have recently prepared materials which may be of interest to those of you in this audience.[11]

The most common use to be made of simulation materials is to provide real world clinical experience for those preparing for any kind of decision-making or planning situation. One of the central values of the simulated positions and problems derives from their reality orientation and their capacity to provide participants and instructors opportunities to test concepts against the facts of decision-makers' and planners'

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9. For a report of the results of this study, see John Hemphill, Daniel Griffiths and Norman Frederiksen, Administrative Performance and Personality (New York: Bureau of Publications, Columbia University, 1962)

10. Ward G. Sybouts, et.al., Madison Public Schools -- Secondary Curriculum (Lincoln: University of Nebraska, 1968).

11. See for example Richard Meckley, Ivan Valentine, and Zane McCoy, Simulation Training in Planning Vocational Education Programs and Facilities (Columbus, Ohio: The Center for Vocational and Technical Education, 1970).

lives. The technique can be used to provide cognitive learning experiences relating to some of the problem areas which planners face. The most common use of simulation in training is related to the processes of administration. Simulation as a mode of instruction provides stimuli to introduce concepts related to morale building, decision-making, goal setting,initiating change, or planning.

The technique can be used in a number of settings. While simulation materials are used frequently in regular classroom settings, they can be used very effectively in workshop settings either on a university campus or on a regular job site. Many users feel that extended and concentrated time involvement is essential if the participants are really going to be able to take advantage of the materials. Others claim to have used complex simulations effectively in regular class sections meeting from one to three times per week. Use of the less complex, shorter form of simulation materials is much more varied. It is possible, for example to deal with a simple set of concepts using a single in-basket item. These shorter forms share many of the advantages of the case study in this respect.

Professor Richard Wynn reported the following potential strengths of the technique.

1. The evident face validity of the situation stimulates interest and motivation in learning and encourages the subject to behave as he might in reality.

2. The written record of performances results in the accumulation of normative data and permits clinical examination and comparison of "on the job" behavior in identical situations.

3. Simulation permits the learner to profit from mistakes that might be disastrous on the job.

4. The instructor in a simulated situation can provide the subject with concepts, research evidence, models, or other information which he can't always send in during the actual game.

5. Simulation provides an opportunity to see the whole picture, to view each problem in broad context.

6. Simulation permits a degree of introspection rarely provided on the real job.

7. The Jefferson School situation presents a subject with an interesting object lesson in simulation as a medium of instruction which he may find useful in his own school situation.

8. Simulation presents an extremely useful research medium, providing the collection of normative and comparative data on behavior and performance in identical situations.[12]

Simulation provides participants an opportunity to encounter situations much like those found in the very ambiguous world planners face each day on the job. Participants are involved in practicing skills that are quite unlike those included in previous educational experiences. Besides reading about and talking about these skills, they actually practice them. Participants gain experience in working with others, in recognizing multiple solutions to problems, in attempting to sell others on their own ideas, and in evaluating the ideas of others.

There is a greater interest and awareness of trends and activities in the real world on the part of participants as they are forced to face real world problems. Students are given opportunity to seek pertinent factual information and acquire certain analytical tools including defining problems, weighing evidence, and collecting data, all of which are important in the real world.

Professor Wynn in the earlier stated article lists the following limitations:

1. The use of simulation depends heavily upon the competence of the instructor using it.

2. Simulated materials are expensive to produce and are subject to obsolesence.

3. Considerable uninterrupted time is needed for full comprehension of the background materials before the in-basket items can be undertaken.

4. There is also a serious question of transferability of learning from the simulated situation to others.

Expanding on the capital cost limitation noted above, an important consideration is that of time or opportunity invested in utilization of simulation devices. In calculating costs of instruction, we often omit the cost related to student time; to disregard such "opportunity costs" would be a serious ommission in considering this particular technique. If, for example, one wants to impart large quantities of rote knowledge in short periods of time, the technique is certainly not appropriate.

Another of the technique's limitations is that its use may artificially simplify the system or universe. By singling out a few variables and dealing with these, participants may not realize that there are

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12. Richard Wynn, "Simulation: Terrible Reality in the Preparation of the School Administrators," "Phi Delta Kappan," December, 1964, pp. 170-173.

few situations in the real world where only a few variables are at work. It is also possible that the use of simulation materials may encourage conservative behavior. If participants are allowed to be very critical of persons who take risks and experiment with new approaches, there will probably be a tendency to conform towards a normative kind of behavior.

One of the limitations advanced earlier relates to the competency of the instructor. The lack of content in the material demands more skill on the part of the instructor than in most other instructional techniques. The tendency on the part of some users to identify "correct" responses is evidence of lack of understanding of the technique.

In spite of frequent warning, some users tend to view the materials as if they contained all the content to be covered, the concepts and skills to be learned. While one can gain skill in writing memos or responding to telephone inquiries based on the simulation exercises, the skill will have to come from some other source than the materials themselves.

In almost all cases the materials are simply stimulus items which can be used to illustrate some of the content or concepts that are to be learned.

Another shortcoming is related to the fact that materials are not readily available for all kinds of problems that administrators have to face and it will be necessary that some be constructed to illustrate particular concepts or processes the instructor feels important. To the best of my knowledge, those developed at the Center for Vocational and Technical Education are the only ones which relate directly to program planning in vocational education.

An additional shortcoming of the common simulation materials is the fact that decision-makers and planners very seldom make decisions without conferring with other people or at least collecting data from them. In other words, most major decisions are made by involving teams of people. The fact that participants are forced to act as individuals and do not come into contact with other persons in the simulation makes for an unrealistic situation. It is many times difficult to respond to a stimulus item without having opportunity to contact another person in the system.

In this writer's opinion, the most critical limitation to existing simulation materials is the fact that feedback is not built into the materials. While users can and normally do allow for feedback, it is not built into the materials. While users can and normally do allow for feedback in the instructional setting, the materials are not developed to a point where feedback is automatic. When a participant responds to an item, he does not get immediate feedback to his response. While participants make a number of decisions, they are not forced to live with the consequences of those decisions and they can go on to make additional decisions in the later stages of the exercise with no feedback resulting from prior actions. Because of the large number of alternative solutions to any problem posed, the computer provides the only

possible branching mechanisms which would allow feedback to become an integral part of the materials.

While the use of simulation in training is not limited to the process it seems to be the most appropriate instructional strategy. Planning is a complex endeavor and simulation is one of the better strategies in that it allows for the participant interaction, so essential in planning.

EPILOGUE

This paper dealt with (1) the Delphi Technique as it might be used in predicting future developments and setting priorities on goals or programs and (2) simulation as it might be used in modeling an organization and training people to engage in organizational planning. The paper might well be described as a limited "bag of tricks;" hopefully, you will be able to modify the strategies reported and create others to use these two powerful but simple concepts in improving your organization's capability to plan for program change.

RESULTS

The data collected from the participant evaluation resulted in developing certain research inferences from analysis of this data, however, to show cause and effect in the findings is very difficult to establish. The method of participant selection, educational experience and background coupled with present position classifications may distort the findings from the participant evaluation. However, analysis of the data did indicate participants did feel that attending the institute was a valuable experience and did impact on their attitude relative to research and informational systems that could be utilized for improving vocational education in metropolitan areas. Generally, the results from the participant institute evaluation indicated they were generally satisfied with the planning and overall operation of the institute.

The results of the institute are presented in the following tables and charts. Each table and chart is preceded by some interpretation. It should be noted that the N factor shown on charts and tables is not always constant as a result of failure on the part of participants to fill out and/or turn in evaluation instruments at the end of each day and at the end of the institute.

Participant Evaluation of Major Topics

A major topic was discussed on each of the five days of the institute. Participants were asked to evaluate each topic at completion of the group discussion for each major topic by means of a one-page (five item) evaluation sheet. The same criteria were used for each topic. The participants were asked to evaluate the topic on a scale of one to five, one being very poor and five very good. A summary of participant evaluation of the five major topics is presented in Table I. A summary of the evaluation of each separate topic by day is presented in Tables V through IX, Monday to Friday, respectively, in Appendix H.

An analysis of Table I indicates that the participants were generally very well satisfied with the discussion topics as the mean score for all evaluation criteria was above 3.5 on a five-point scale. An overwhelming majority (68%) of the participants indicated the content value of the prepared papers was very good, and 66 percent indicated the first reactor's contribution to the topic was very good.

A further analysis of the data in Table I reveals the weakest area of the discussions was in the value of the concepts (material) utilized or developed by groups relative to the topic being discussed. This item had the lowest mean score (3.57) of all items with only 46 percent of the respondents rating it above three. Participants were asked to indicate the value of the topics relative to their contribution in meeting the objectives of the institute. A majority (67%) rated the topics good to very good.

TABLE I

SUMMARY OF PARTICIPANT EVALUATION OF FIVE MAJOR TOPICS

N= 191

Items from Questionnaire Relative To Participant Opinion Concerning Assigned Topic for Discussion	Very Poor 1		2		3		4		Very Good 5		No Response		Mean Score
	No	%	No	%	No	%	No	%	No	%	No	%	
1. Content value of the prepared paper, sent to you in advance.	0	0	9	5	51	27	99	52	31	16	1	0	3.7975
2. Value of reactors contribution to the topic.	1	0	9	5	50	26	80	42	45	24	6	3	3.8588
a. Reactor no. 1	0	0	8	4	28	15	58	30	20	11	77	40	3.8836
b. Reactor no. 2													
3. How would you rate the value of the concepts (material)utilized or developed by your group relative to this topic?	3	2	9	5	60	31	73	38	16	8	30	16	3.5700
4. The ability of the discussion leader to hold and direct the groups activities for accomplishing the objectives of this topic.	2	1	12	6	46	24	66	35	34	18	31	16	3.7797
5. The value of this topic relative to its contribution to meeting the objectives of the Institute.	0	0	7	4	43	22	87	46	41	21	13	7	3.9420
6. How would you rate the contributions made by individuals of this group during the work session?	2	1	3	1	49	26	84	44	24	13	29	15	3.7189

Participants Attitude Relative
To Vocational Education

A questionnaire was developed to determine the institute participants attitude or feelings concerning Vocational Education. The items included in the questionnaire are presented in Table II and give a cross sectional result of the participants attitude toward these items. Participants were asked to indicate their feelings or attitudes about each item on a scale of strongly agree, agree, undecided, disagree, and strongly disagree. Data is presented in the form of frequency counts and percentage of responses for each item.

An analysis of the data in Table II indicates that generally an overwhelming majority of respondents have a positive attitude toward the value of Vocational Education. Ninety-eight percent of the respondents indicated that real benefit could be expected from Vocational Education courses and 100 percent indicated the importance of vocational education cannot be emphasized enough. A majority of the respondents reacted positively to the importance of Vocational Education for all students regardless of their goals in life. An overwhelming majority (98%) of the participants indicated that Vocational Education should be included in secondary schools, and thirty-nine participants (95%) felt vocational education should not be offered only in Technical Institutes or Community Colleges. Four items on the questionnaire were in relation to Vocational Education as the answer to unemployment, youth unrest, and school dropouts. It is significant that a majority of the participants responded positively to these items in all four cases.

Further analysis of Table II reveals that 88 percent of the participants felt that a larger portion of the school budget should be allocated to Vocational Education and 81 percent indicated that present educational funds should be redistributed to emphasize Vocational Education. It is significant to note that 22 percent of the respondents agreed and 46 percent were undecided relative to rural Vocational Education teachers being less adequately prepared than Vocational Education teachers in general. Similarly, 22 percent agreed and 34 percent were undecided relative to the requirement for more inclusive preparation for general Vocational Education teachers than for rural ones. A rewarding response from an overwhelming majority (91%) of the participants indicated they felt vocational teaching was just as valuable to society as professional teaching.

TABLE II

SUMMARY OF PARTICIPANTS' ATTITUDE
RELATIVE TO VOCATIONAL EDUCATION

N= 41

Items from Questionnaire Relative to Participants' Attitude or Feelings Concerning Vocational Education	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		No Answer	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1. No real benefit can be expected of Vocational Education courses.	1	2	0	0	0	0	4	10	36	88	0	0
2. Students capable of success in college should be discouraged from taking Vocational Education courses.	1	2	0	0	1	2	16	39	23	56	0	0
3. The importance of Vocational Education cannot be emphasized enough.	20	49	21	51	0	0	0	0	0	0	0	0
4. Failure to offer Vocational Education cannot be justified in a democratic society.	25	61	14	34	0	0	1	2	1	2	0	0
5. Vocational Education is geared to the past.	0	0	4	10	6	15	20	49	10	24	1	2
6. The major function of the High School should be the preparation of students for entrance into college.	0	0	0	0	1	2	14	34	26	63	0	0
7. Vocational Education should be offered only to students with low academic ability.	0	0	0	0	0	0	9	22	32	78	0	0

TABLE II, Cont.

SUMMARY OF PARTICIPANTS' ATTITUDE
RELATIVE TO VOCATIONAL EDUCATION

N= 41

Items from Questionnaire Relative to Participants Attitude or Feelings Concerning Vocational Education	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		No Answer	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
8. The cost of training workers should not be born by the Public School system.	0	0	6	15	4	10	18	44	13	32	0	0
9. There is no place in secondary schools for Vocational Education.	0	0	1	2	0	0	13	32	27	66	0	0
10. Vocational Education should be handled outside the academic school system--in Technical Institutes or Community Colleges.	0	0	1	2	1	2	17	41	22	54	0	0
11. Increased emphasis on Vocational Education would not result in fewer dropouts.	1	2	6	15	4	10	18	44	11	27	1	2
12. Every High School Graduate should be equipped with a salable skill.	20	49	14	34	2	5	5	12	0	0	0	0
13. Increased Vocational Education may be the answer to the problems of unemployment.	6	15	26	63	7	17	2	5	0	0	0	0

TABLE II, Cont.

SUMMARY OF PARTICIPANTS' ATTITUDE
RELATIVE TO VOCATIONAL EDUCATION

N= 41

Items from Questionnaire Relative to Participants Attitude or Feelings Concerning Vocational Education	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		No Answer	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
14. Academic Educational courses are more useful than Vocational courses to the average student.	0	0	4	10	10	24	17	41	10	24	0	0
15. No secondary school should be accredited unless it offers a comprehensive program of Vocational Education, given adequate funds.	8	20	15	37	7	17	11	27	0	0	0	0
16. The information provided in the college preparatory courses can be applied to more jobs than the information available in Vocational Education courses.	0	0	4	10	7	17	23	56	6	15	1	2
17. More students should be encouraged to enroll in Vocational Education programs.	14	34	24	59	1	2	1	2	0	0	1	2
18. Vocational Education is an educational frill.	1	2	0	0	0	0	15	37	24	59	1	2
19. No area of education is more important than Vocational Education.	5	12	15	37	14	34	6	15	0	0	1	2

TABLE II, Cont.

SUMMARY OF PARTICIPANTS' ATTITUDE
RELATIVE TO VOCATIONAL EDUCATION

N= 41

Items from Questionnaire Relative to Participants Attitude or Feelings Concerning Vocational Education	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		No Answer	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
20. Public Expenditure of funds for Vocational Education is the best educational expenditure that can be made.	6	15	20	49	11	27	3	7	0	0	1	2
21. The general education curriculum is the best preparation for entry into an occupation upon graduation from high school.	0	0	2	5	3	7	27	66	8	20	1	2
22. Vocational Education courses are as important for college bound students as they are for non-college bound students.	6	15	25	61	4	10	5	12	0	0	1	2
23. The proportion of the school budget allocated to Vocational Education should be increased markedly.	11	27	25	61	3	7	1	2	0	0	1	2
24. Vocational Education is one answer to youth unrest in this country.	10	24	22	54	6	15	2	5	0	0	1	2
25. Redistribution of present education funds to emphasize Vocational Education would probably yield a higher national per capita income.	8	20	25	61	5	12	2	5	0	0	1	2

TABLE II, Cont.

SUMMARY OF PARTICIPANTS' ATTITUDE
RELATIVE TO VOCATIONAL EDUCATION

N= 41

Items from Questionnaire Relative to Participants Attitude or Feelings Concerning Vocational Education	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		No Answer	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
26. Vocational Education courses prepare students for many jobs which lack prestige.	0	0	17	41	6	15	19	46	0	0	1	2
27. All students should be enrolled in at least one Vocational Education class while in school.	7	17	27	66	4	10	2	5	0	0	1	2
28. Rural youth are being educationally shortchanged due to inadequate Vocational offerings.	4	10	23	56	7	17	6	15	0	0	1	2
29. Vocational Education in rural areas is more important than Vocational Education in urban areas.	0	0	1	2	4	10	35	85	0	0	1	2
30. Currently employed rural Vocational Education teachers are less adequately prepared than Vocational Education teachers in general.	0	0	9	22	19	46	12	29	1	2	0	0
31. More inclusive preparation is required for Vocational teachers in general than for rural Vocational Education teachers.	0	0	9	22	14	34	17	41	1	2	0	0

TABLE II, Cont.

SUMMARY OF PARTICIPANTS' ATTITUDE
RELATIVE TO VOCATIONAL EDUCATION

N= 41

Items from Questionnaire Relative to Participants Attitude or Feelings Concerning Vocational Education	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		No Answer	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
32. Only the non-college-bound need Vocational Education.	0	0	1	2	0	0	27	66	13	32	0	0
33. Academic courses are applicable to a wider spectrum of jobs than Vocational Education courses.	0	0	7	17	4	10	23	56	7	17	0	0
34. Most students would not benefit from the job skill instruction offered in Vocational Education programs.	0	0	0	0	4	10	28	68	9	22	0	0
35. Vocational Education courses are beneficial primarily for those who are terminating their education at the end of High School.	0	0	9	22	2	5	28	68	2	5	0	0
36. The Vocational Education curricu lum provides a better preparation for more jobs than does the college preparatory courses.	5	12	24	59	6	15	6	15	0	0	0	0
37. Vocational Education courses provide learning experiences geared to individual needs better than academic courses.	6	15	28	68	6	15	1	2	0	0	0	0

TABLE II, Cont.

SUMMARY OF PARTICIPANTS' ATTITUDE
RELATIVE TO VOCATIONAL EDUCATION

N= 41

Items from Questionnaire Relative to Participants Attitude or Feelings Concerning Vocational Education	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		No Answer	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
38. Vocational Education programs help keep the potential dropout in school.	6	15	28	68	6	15	1	2	0	0	0	0
39. Vocational training is not as valuable to society as training for the professions.	0	0	1	2	3	7	24	59	13	32	0	0

Participants Evaluation of the Institute

At the close of the institute a questionnaire was administered to participants in order to gain an evaluation of the overall effectiveness of the institute. Items included in the questionnaire are presented in Table III and in Charts I, II, and III.

Participants were asked to indicate their feelings about each item in Table I on a scale of strongly agree, agree, undecided, disagree, strongly disagree, or no answer. Data is presented in the form of frequency counts and percentage of responses for each item.

An analysis of the data in Table III indicates that the overall attitude of the participants toward the institute was a positive one. Ninety-eight percent of the participants felt that their time was well spent in attending the institute and one-hundred percent of the participants felt that they had explored and learned new ideas and concepts during the course of the institute. The majority (85%) of the participants felt that the objectives of the institute were in line with their own, and that they were clear and realistic. An overwhelming majority of participants felt that the theory presented in the institute topics did relate to actual practice, and that printed materials provided were helpful in their situation.

Participants were asked to indicate whether they intended to modify present or future work as a result of their participation in this institute. Chart I reveals that an overwhelming majority (94%) indicated that they did intend to make a change at present or sometime in the future.

Participants were asked to indicate their feelings relative to attending the institute if they had the opportunity to do so again and also relative to their recommendation for others to take part in an institute of this type. Both items were rated on a scale of yes, no, uncertain, or no response, and results are shown in Charts II and III.

Analysis of Chart II shows that a great majority (94%) of the participants would apply to attend the institute if they were afforded the opportunity to do so again. It is significant to note that none of the participants indicated that they would definitely not apply to attend.

Analysis of the data in Chart III indicates that ninety-four percent of the participants would recommend attendance at such an institute to others. Again, it is significant to note that none of the participants would recommend against attendance at such an institute.

TABLE III

SUMMARY OF PARTICIPANT'S
EVALUATION OF INSTITUTE

N=48

Items from Questionnaire Relative to Participants Evaluation of Institute	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		No Answer	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1. The objectives of this institute were clear to me.	1	2	36	75	4	8	7	15	0	0	0	0
2. The objectives of this institute were not realistic.	0	0	2	4	3	6	35	73	8	17	0	0
3. The participants accepted the purposes of this institute.	4	8	38	79	5	10	0	0	1	2	0	0
4. The objectives of this institute were not the same as my objectives.	0	0	5	10	2	4	35	73	5	10	1	2
5. I have not learned anything new.	0	0	0	0	0	0	18	38	30	63	0	0
6. The material presented seemed valuable to me.	17	35	30	63	0	0	1	2	0	0	0	0
7. I could have learned as much by reading a book.	1	2	0	0	3	6	27	56	17	35	0	0
8. Possible solutions to my problems were not considered.	0	0	4	8	5	10	36	75	3	6	0	0
9. The information presented was to elementary.	0	0	0	0	0	0	37	77	11	23	0	0

TABLE III, Cont.

SUMMARY OF PARTICIPANT'S
EVALUATION OF INSTITUTE

N=48

Items from Questionnaire Relative to Participants Evaluation of Institute	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		No Answer	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
10. The speakers really knew their subject.	10	21	29	58	6	13	2	4	0	0	1	2
11. I was stimulated to think about the topics presented.	11	23	37	77	0	0	0	0	0	0	0	0
12. We worked together well as a group.	10	21	29	60	3	6	4	8	2	4	0	0
13. The group discussions were excellent.	5	10	26	54	10	21	5	10	2	4	0	0
14. There was little time for informal conversation.	1	2	10	21	0	0	30	63	7	15	0	0
15. I had no opportunity to express my ideas.	0	0	4	8	0	0	26	54	18	38	0	0
16. I really felt a part of this group.	8	17	34	71	2	4	4	8	0	0	0	0
17. My time was well spent.	12	25	35	73	1	2	0	0	0	0	0	0
18. The Institute met my expectations.	10	21	29	60	6	13	3	6	0	0	0	0
19. Too much time was devoted to trivial matters.	0	0	7	15	3	6	29	60	9	19	0	0

TABLE III, Cont.

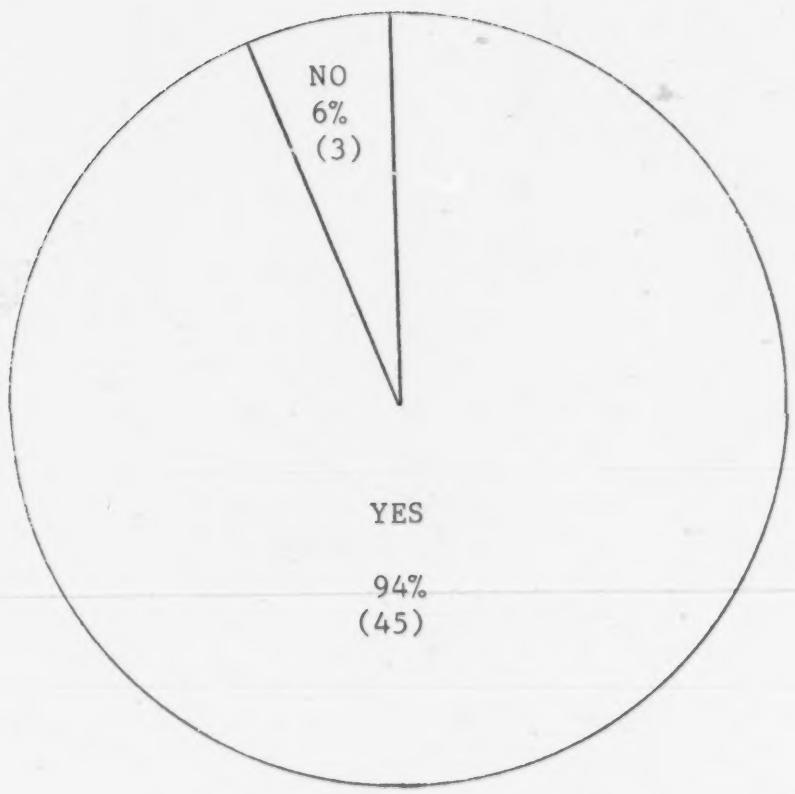
SUMMARY OF PARTICIPANT'S
EVALUATION OF INSTITUTE

N=48

Items from Questionnaire Relative to Participants Evaluation of Institute	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		No Answer	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
20. The information presented was too advanced.	0	0	2	4	0	0	39	81	7	15	0	0
21. The content was not readily applicable to the important problems in this area.	0	0	3	6	3	6	30	63	12	25	0	0
22. Theory was not related to practice.	0	0	2	4	3	6	36	75	7	15	0	0
23. The printed materials that were provided were very helpful.	13	27	30	63	2	4	3	6	0	0	0	0
24. The schedule should have been more flexible.	0	0	11	23	12	25	22	46	3	6	0	0

CHART I

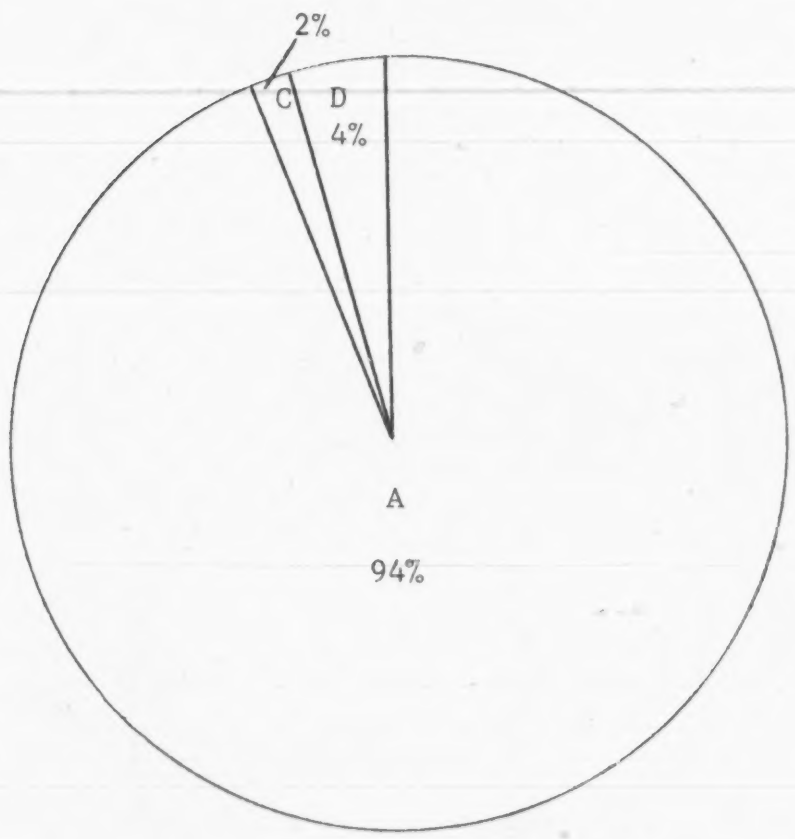
AS A RESULT OF PARTICIPATION IN THIS
INSTITUTE, RESPONDENT INTENDS TO
MODIFY PRESENT OR FUTURE WORK



N=48

CHART II

RESPONSE RELATIVE TO APPLYING FOR
INSTITUTE IF PARTICIPANT HAD OPPORTUNITY
TO DO SO AGAIN



N=48

Item	Number
A - Yes	45
B - No	0
C - Uncertain	1
D - No Response	2

CHART III

RESPONSE RELATIVE TO PARTICIPANT'S
RECOMMENDATION FOR OTHERS
TO TAKE PART IN AN INSTITUTE
OF THIS TYPE

N=48

Item	Number
A - Yes	45
B - No	0
C - Uncertain	1
D - No Response	2

Participant's Post-Institute Evaluation

The planning for the institute did include procedures for a post-institute follow-up study. The follow-up of participants was conducted six months after the institute was completed and a copy of the instrument used to collect the participant data is included in Appendix F.

A post-institute evaluation questionnaire was developed to determine the extent of changes which had been made as a result of the initial institute. Items included in the questionnaire are presented in Table IV.

It should be noted that eighty percent of the post-institute evaluation questionnaires were returned. Of these questionnaires (40) three were received too late to be included in the data analysis reported for this study. As a result, analysis reported herein is computed on the basis of thirty seven returns or seventy-four percent of the total number of questionnaires sent to participants (50).

Participants were asked to indicate either yes, no, or no answer in response to the items in Table IV. Data is presented in the form of frequency counts and percentage of responses for each item in the questionnaire.

An analysis of the data in Table IV indicates that a great majority (81%) of the institute participants had re-evaluated their present vocational programs, and fifty-four percent had made changes in their programs. It is interesting to note that even though a large percentage of participants had re-evaluated their programs, only a few had gone on to construct new curricula, write courses of study, articles, or materials. It is encouraging to note that a large percentage had gone on to do a job of public relations in explaining new concepts to vocational teachers in their institution, district or state. A majority (65%) had helped others to construct new curricula.

Further analysis of data indicates that seventy-eight percent of the participants had referred to and used the printed material provided at the institute. Sixty-eight percent indicated that they constantly used information presented at the institute. These figures would tend to substantiate the timeliness and relevancy of the institute in meeting the needs of the individual participants. An interesting and rewarding response to an item on the questionnaire revealed that sixty-five percent of the participants had kept in contact with some of the other participants and/or consultants they had met during the institute.

TABLE IV

SUMMARY OF PARTICIPANT'S
POST-INSTITUTE EVALUATION
OF INSTITUTE NO. IX

N= 37

Items from Questionnaire Relative to Participants Post-Institute Evaluation of Institute No. IX September 14-18, 1970 Albuquerque, New Mexico	Yes		No		No Answer	
	Number	Percent	Number	Percent	Number	Percent
1. Have re-evaluated present vocational programs.	30	81	5	14	2	5
2. Have made changes in present vocational programs.	20	54	14	38	3	8
3. Have explained new concepts to vocational teachers in the school district, institution or state that I represent.	31	84	3	8	3	8
4. Have constructed new curricula.	12	32	23	62	2	5
5. Have helped others construct new curricula.	24	65	11	30	2	5
6. Have planned new instructional programs.	21	57	13	35	3	8
7. Have written courses of study.	5	14	29	78	3	8
8. Have written proposals for vocational programs.	21	57	14	38	2	5
9. Have written articles or other materials.	10	27	25	68	2	5
10. Have initiated exemplary programs.	16	43	20	54	1	3

TABLE IV, Cont.

SUMMARY OF PARTICIPANT'S
POST-INSTITUTE EVALUATION
OF INSTITUTE NO. IX

N=37

Items from Questionnaire Relative to Participants Post-Institute Evaluation of Institute No. IX September 14-18, 1970 Albuquerque, New Mexico	Yes		No		No Answer	
	Number	Percent	Number	Percent	Number	Percent
11. Have been working more closely with various segments of the community such as business, industry, and/or agriculture.	17	46	17	46	3	8
12. Have given talks on vocational education.	22	59	13	35	2	5
13. Have been working more effectively with other educators.	27	73	3	8	7	19
14. Have been constantly using some of the information presented at the institute.	25	68	10	27	2	5
15. Have definitely learned new concepts which have been valuable to me.	33	89	4	11	0	0
16. Have referred to and used the printed materials that were provided at the institute.	29	78	6	16	2	5
17. Have become more aware of the vocational needs of the disadvantaged.	28	76	8	22	1	3
18. Have developed specific programs for the needs of the disadvantaged.	17	46	16	43	4	11

TABLE IV, Cont.

SUMMARY OF PARTICIPANT'S
POST-INSTITUTE EVALUATION
OF INSTITUTE NO. IX

N=37

Items from Questionnaire Relative to Participants Post-Institute Evaluation of Institute No. IX September 14-18, 1970 Albuquerque, New Mexico	Yes		No		No Answer	
	Number	Percent	Number	Percent	Number	Percent
19. Have modified some of my present or planned activities in vocational education.	34	92	1	3	2	5
20. Have kept in contact with some of the participants and/or consultants I met during the institute.	24	65	12	32	1	3

Analysis of Participant Selection

Plans for selection of participants to the institute called for a total of 50 trainees from states west of the Mississippi River. Of these 50, there were to be 25 superintendents, or assistant superintendents, or state department personnel, 15 RCU directors, and 10 classified in curriculum development or coordination. A summary of participants by state and position classification is given in Table X included in Appendix I. An analysis of this table reveals that 18 states were represented and participant selection deviated only slightly from selection plans. There were 26 in the superintendent, or assistant superintendent, or state department category instead of the planned 25. The RCU directors and curriculum personnel were almost exactly reversed from planned numbers with 10 and 14, respectively, instead of 15 and 10 desired.

CONCLUSIONS AND RECOMMENDATIONS

Introduction:

The nation-wide growth in vocational education and the demand for accountability, has brought about a tremendous need for innovations in vocational education, especially in metropolitan areas. Research and development activities develop these innovations, but they must be identified and used to revitalize vocational education. This institute provided participants the opportunity to evaluate the results of research and development activities and to acquire a research base relative to identifying innovations and the change process as it relates to vocational education in metropolitan areas.

Conclusions:

The conclusions which have been developed are presented in the following statements:

1. The geographical mix of participants promoted valuable exchanges of information about innovations resulting from research and development programs.

2. Selection of participants provided cross-sectional variety of service areas, institutional classifications, and professional position classifications.

3. Evaluation results indicated that participants were generally well pleased with the presentations and overall operation of the institute.

4. There was evidence that a majority of participants had re-evaluated their programs and had implemented or planned to implement positive program change as a result of having attended the institute.

5. All of the participants felt that they had explored and learned new ideas and concepts that related to actual practice in programming vocational offerings in metropolitan areas.

Recommendations:

Based on the experience of the institute and the evaluations (see Results Section) the following recommendations are offered regarding the nature and need for future training projects.

1. Institutions should be encouraged to sponsor institutes providing for continuation of training in the application of vocational education innovations resulting from research and development programs.

2. At future institutes, every effort should be made to attract participants from new and developing institutions and programs.

3. Preparation and dissemination of printed material related to practical situations that can be used immediately by the participants should be continued and improved.

4. A study should be conducted to determine the need for training vocational educators in research and development techniques.

5. Time for individual and group participation in the program should be continued.

Summary:

Participants evaluation of the institute revealed that it was apparently successful in meeting the objectives which were established. Re-evaluation of programs, program changes and increased public relations to explain new concepts to local education and educational leaders undertaken by participants indicated they had been motivated by the institute programs.

APPENDICES

APPENDIX A

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APPENDIX B

SUNDAY
September 13, 1970

9:00 AM - 9:00 PM Registration, Main Desk
Downtowner Motor Inn
717 Central Avenue, NW
Albuquerque, New Mexico

6:00 PM - 8:30 PM Refreshments - Zuni Room

Courtesy of Richard Distributing Company

Buffet Supper - Sun & Rain Room
(Bring Meal Tickets)

Lodging, meals, and all sessions, will be in the Downtowner Motor Inn.

Show Meal Tickets at all Meals.

MONDAY
September 14, 1970

7:00 AM - 8:00 AM	Breakfast - Sun & Rain Room
8:00 - 9:00 AM	Registration - Main Desk
9:00 - 10:15 AM	Introduction to the Institute, Sun & Rain Room

Welcome to New Mexico
Mr. Ernest Vigil, State Director
Vocational-Technical Education

Welcome to Albuquerque
Dr. Noah C. Turpen, Deputy Superintendent
Albuquerque Public Schools

Mr. Mahlon Love, Vice President
Greater Albuquerque Chamber of Commerce

Mr. Louis E. Saavedra, Vice President
Albuquerque Technical-Vocational Institute

Mr. Charles E. Barnhart, Chairman
Albuquerque City Commission

10:15 - 10:45 AM	Break
10:45 - 11:15 AM	Orientation to the Institute
11:45 - 12:30 PM	Luncheon - Sun & Rain Room
12:30 PM - 1:15 PM	Reactor's Presentation to Topic One:

"An Assessment of Present Information Systems and Implications for Vocational Education"

Dr. Dale Sparks, Assistant Professor
Electrical Engineering Department
University of New Mexico

Dr. William Stevenson, Assistant State Director
Head, Division of Research, Planning and Evaluation
Oklahoma State University

1:30 - 5:00 PM	Group Work Sessions

Group A - Sun Room
Group B - Rain Room
Group C - Zuni Room

6:00 - 7:00 PM	Dinner - Sun & Rain Room

Evening Free

TUESDAY
September 15, 1970

7:00 AM - 8:00 AM	Breakfast - Sun & Rain Room
8:30 - 11:15 AM	Group Work Sessions Group A - Sun Room Group B - Rain Room Group C - Zuni Room
11:45 - 12:30 PM	Lunch - Sun & Rain Room
12:30 PM - 1:15 PM	Reactor's Presentation to Topic Two: "Systems Analysis As An Instrument For Change In Urban Education" Dr. Harry Huffman, Professor Department of Vocational Education Colorado State University Dr. L. Paul Robertson, Education Counselor University Relations Division Sandia Laboratories, AEC
1:30 - 5:00 PM	Group Work Sessions Group A - Sun Room Group B - Rain Room Group C - Zuni Room
5:30	Board Bus to Sandia Crest Tramway (wear a jacket)
7:00 - 8:00 PM	Dinner - Sandia Peak Summit Inn Courtesy of the Albuquerque National Bank

WEDNESDAY
September 16, 1970

7:00 AM - 8:00 AM	Breakfast - Sun & Rain Room
7:15 - 11:15 AM	Group Work Sessions
	Group A - Sun Room Group B - Rain Room Group C - Zuni Room
11:45 AM - 12:30 PM	Lunch - Sun & Rain Room
12:30 PM - 1:15 PM	Reactor's Presentation to Topic Three:
	"Long-Range Planning In Vocational-Technical Education" Dr. Melvin Barlow, Professor Division of Vocational Education University of California at Los Angeles
1:30 - 5:00 PM	Group Work Sessions
	Group A - Sun Room Group B - Rain Room Group C - Zuni Room
6:00 - 7:00 PM	Dinner - Sun & Rain Room

Evening Free

THURSDAY
September 17, 1970

7:00 AM - 8:00 AM	Breakfast - Sun & Rain Room
8:30 - 11:15 AM	Group Work Sessions

Group A - Sun Room
Group B - Rain Room
Group C - Zuni Room

11:45 - 12:30 PM	Lunch - Sun & Rain Room
12:30 PM - 1:15 PM	Reactor's Presentation to Topic Four:

"An Overview for the Application of Community Resources Relative to Specific Educational Needs"

Dr. Walter Brooking
Program Officer
U.S. Office of Education

Dr. Robert L. Darcy, Professor
Economics Department
Colorado State University

1:30 - 5:00 PM	Group Work Sessions

Group A - Sun Room
Group B - Rain Room
Group C - Zuni Room

6:30 - 7:00 PM	Refreshments in Zuni Room Courtesy of Downtowner Motor Inn
7:00 - 9:30 PM	Banquet - Sun & Rain Room

Address:

Mr. Jack M. Campbell, Director
Institute for Social Research and Development
University of New Mexico

FRIDAY
September 18, 1970

7:00 AM - 8:30 AM	Breakfast - Sun & Rain Room
8:30 - 11:15 AM	Presentation of Topic Five:

"Using The Delphi Technique And Simulation Exercises In Implementing Planned Program Change In Vocational Education"

Dr. Donald Anderson, Dean
School of Education
Ohio State University

11:45 - 12:30 PM	Lunch - Sun & Rain Room
1:15 PM - 5:00 PM	Summary

Administrative Details

APPENDIX C

ANMI-70-M

MONDAY

Training Professional Personnel
Responsible for Vocational-Technical Education
Western Metropolitan Areas

Albuquerque
New Mexico
Institute IX

Application of Vocational Education Innovations
Resulting from Research and Development Program

PARTICIPANT EVALUATION OF MAJOR TOPICS

Topic--An Assessment of Present Information Systems and Implications for Vocational Education

Instructions:

Indicate, on the five point scale, your opinion concerning the value of the content and quality of material utilized, consultants material, group leaders, and the reactors comments to the topics for discussion on the assigned topic. Please circle your response.

	Very Poor				Very Good
1. Content value of the prepared paper, sent to you in advance.	1	2	3	4	5
2. Value of reactors contribution to the topic.					
a. Reactor no. 1	1	2	3	4	5
b. Reactor no. 2	1	2	3	4	5
3. How would you rate the value of the concepts (material) utilized or developed by your group relative to this topic.	1	2	3	4	5
4. The ability of the discussion leader to hold and direct the groups activities for accomplishing the objectives of this topic.	1	2	3	4	5
5. The value of this topic relative to its contribution to meeting the objectives of the Institute.	1	2	3	4	5
6. How would you rate the contributions made by individuals of this group during the work session?	1	2	3	4	5

7. What additional information would you have desired?

8. Special comments to improve the effectiveness of the Institute or the individual working sessions.

ANMI-70-T

TUESDAY

Training Professional Personnel
Responsible for Vocational-Technical Education
Western Metropolitan Areas

Albuquerque
New Mexico
Institute IX

Application of Vocational Education Innovations
Resulting from Research and Development Program

PARTICIPANT EVALUATION OF MAJOR TOPICS

Topic--Systems Analysis As An Instrument For Change In Urban Education

Instructions:

Indicate, on the five point scale, your opinion concerning the value of the content and quality of material utilized, consultants material, group leaders, and the reactors comments to the topics for discussion on the assigned topic. Please circle your response.

	Very Poor				Very Good
1. Content value of the prepared paper, sent to you in advance.	1	2	3	4	5
2. Value of reactors contribution to the topic.					
a. Reactor no. 1	1	2	3	4	5
b. Reactor no. 2	1	2	3	4	5
3. How would you rate the value of the concepts (material) utilized or developed by your group relative to this topic.	1	2	3	4	5
4. The ability of the discussion leader to hold and direct the groups activities for accomplishing the objectives of this topic.	1	2	3	4	5
5. The value of this topic relative to its contribution to meeting the objectives of the Institute.	1	2	3	4	5
6. How would you rate the contributions made by individuals of this group during the work session.	1	2	3	4	5

7. What additional information would you have desired?

8. Special comments to improve the effectiveness of the Institute or the individual working sessions.

ANMI-70-W

WEDNESDAY

Albuquerque
New Mexico
Institute IX

Training Professional Personnel
Responsible for Vocational-Technical Education
Western Metropolitan Areas

Application of Vocational Education Innovations
Resulting from Research and Development Program

PARTICIPANT EVALUATION OF MAJOR TOPICS

Topic--Long-Range Planning In Vocational-Technical Education

Instructions:

Indicate, on the five point scale, your opinion concerning the value of the content and quality of material utilized, consultants material, group leaders, and the reactors comments to the topics for discussion on the assigned topic. Please circle your response.

	Very Poor				Very Good
1. Content value of the prepared paper, sent to you in advance.	1	2	3	4	5
2. Value of reactors contribution to the topic.					
a. Reactor no. 1	1	2	3	4	5
b. Reactor no. 2	1	2	3	4	5
3. How would you rate the value of the concepts (material) utilized or developed by your group relative to this topic.	1	2	3	4	5
4. The ability of the discussion leader to hold and direct the groups activities for accomplishing the objectives of the topic.	1	2	3	4	5
5. The value of this topic relative to its contribution to meeting the objectives of the Institute.	1	2	3	4	5
6. How would you rate the contributions made by individuals of this group during the work session.	1	2	3	4	5

7. What additional information would you have desired?

8. Special comments to improve the effectiveness of the Institute or the individual working sessions.

ANMI-70-Th

THURSDAY

Training Professional Personnel
Responsible for Vocational-Technical Education
Western Metropolitan Areas

Albuquerque
New Mexico
Institute IX

Application of Vocational Education Innovations
Resulting from Research and Development Program

PARTICIPANT EVALUATION OF MAJOR TOPICS

Topic--An Overview For The Application Of Community Resources Relative to Specific Educational Needs

Instructions:

Indicate, on the five point scale, your opinion concerning the value of the content and quality of material utilized, consultants material, group leaders, and the reactors comments to the topics for discussion on the assigned topic. Please circle your response.

	Very Poor				Very Good
1. Content value of the prepared paper, sent to you in advance.	1	2	3	4	5
2. Value of reactors contribution to the topic.					
a. Reactor no. 1	1	2	3	4	5
b. Reactor no. 2	1	2	3	4	5
3. How would you rate the value of the concepts (material) utilized or developed by your group relative to this topic.	1	2	3	4	5
4. The ability of the discussion leader to hold and direct the groups activities for accomplishing the objectives of the topic.	1	2	3	4	5
5. The value of this topic relative to its contribution to meeting the objectives of the Institute.	1	2	3	4	5
6. How would you rate the contributions made by individuals of this group during the work session.	1	2	3	4	5

7. What additional information would you have desired?

8. Special comments to improve the effectiveness of the Institute or the individual working sessions.

ANMI-70-F

FRIDAY

Training Professional Personnel
Responsible for Vocational-Technical Education
Western Metropolitan Areas

Albuquerque
New Mexico
Institute IX

Application of Vocational Education Innovations
Resulting from Research and Development Program

PARTICIPANT EVALUATION OF MAJOR TOPICS

Topic--Using The Delphi Technique And Simulation Exercises In Implementing Planned Program Change In Vocational Education

Instructions:

Indicate, on the five point scale, your opinion concerning the value of the content and quality of material utilized, consultants material, group leaders, and the reactors comments to the topics for discussion on the assigned topic. Please circle your response.

	Very Poor				Very Good
1. Content value of the prepared paper, sent to you in advance.	1	2	3	4	5
2. Value of reactors contribution to the topic.					
a. Reactor no. 1	1	2	3	4	5
b. Reactor no. 2	1	2	3	4	5
3. How would you rate the value of the concepts (material) utilized or developed by your group relative to this topic.	1	2	3	4	5
4. The ability of the discussion leader to hold and direct the groups activities for accomplishing the objectives of the topic.	1	2	3	4	5
5. The value of this topic relative to its contribution to meeting the objectives of the Institute.	1	2	3	4	5
6. How would you rate the contributions made by individuals of this group during the work session.	1	2	3	4	5

7. What additional information would you have desired?

8. Special comments to improve the effectiveness of the Institute or the individual working sessions.

APPENDIX D

INSTITUTE IX

FORM 1

KEY: SA (Strongly Agree), A (Agree), ? (Undecided), D (Disagree), SD (Strongly Disagree)

1. No real benefit can be expected of Vocational Education courses.	SA	A	?	D	SD
2. Students capable of success in college should be discouraged from taking Vocational Education courses.	SA	A	?	D	SD
3. The importance of Vocational Education cannot be emphasized enough.	SA	A	?	D	SD
4. Failure to offer Vocational Education cannot be justified in a democratic society.	SA	A	?	D	SD
5. Vocational Education is geared to the past.	SA	A	?	D	SD
6. The major function of the High School should be the preparation of students for entrance into college.	SA	A	?	D	SD
7. Vocational Education should be offered only to students with low academic ability.	SA	A	?	D	SD
8. The cost of training workers should not be borne by the Public School system.	SA	A	?	D	SD
9. There is no place in secondary schools for Vocational Education.	SA	A	?	D	SD
10. Vocational Education should be handled outside the academic school system--in Technical Institutes or Community Colleges.	SA	A	?	D	SD
11. Increased emphasis on Vocational Education would not result in fewer dropouts.	SA	A	?	D	SD
12. Every High School graduate should be equipped with a salable skill.	SA	A	?	D	SD
13. Increased Vocational Education may be the answer to the problems of unemployment.	SA	A	?	D	SD
14. Academic Educational courses are more useful than Vocational courses to the average student.	SA	A	?	D	SD
15. No secondary school should be accredited unless it offers a comprehensive program of Vocational Education, given adequate funds.	SA	A	?	D	SD

KEY: SA (Strongly Agree), A (Agree), ? (Undecided), D (Disagree), SD (Strongly Disagree)

16. The information provided in the college preparatory courses can be applied to more jobs than the information available in Vocational Education courses.	SA	A	?	D	SD
17. More students should be encouraged to enroll in Vocational Education programs.	SA	A	?	D	SD
18. Vocational Education is an educational frill.	SA	A	?	D	SD
19. No area of education is more important than Vocational Education.	SA	A	?	D	SD
20. Public expenditure of funds for Vocational Education is the best educational expenditure that can be made.	SA	A	?	D	SD
21. The general education curriculum is the best preparation for entry into an occupation upon graduation from High School.	SA	A	?	D	SD
22. Vocational Education courses are as important for college bound students as they are for non-college bound students.	SA	A	?	D	SD
23. The proportion of the school budget allocated to Vocational Education should be increased markedly.	SA	A	?	D	SD
24. Vocational Education is one answer to youth unrest in this country.	SA	A	?	D	SD
25. Redistribution of present education funds to emphasize Vocational Education would probably yield a higher national per capita income.	SA	A	?	D	SD
26. Vocational Education courses prepare students for many jobs which lack prestige.	SA	A	?	D	SD
27. All students should be enrolled in at least one Vocational Education class while in school.	SA	A	?	D	SD
28. Rural youth are being educationally short-changed due to inadequate Vocational offerings.	SA	A	?	D	SD
29. Vocational Education in rural areas is more important than Vocational Education in urban areas.	SA	A	?	D	SD

KEY: SA (Strongly Agree), A (Agree), ? (Undecided), D (Disagree), SD (Strongly Disagree)

30. Currently employed rural Vocational Education teachers are less adequately prepared than Vocational Education teachers in general.	SA	A	?	D	SD
31. More inclusive preparation is required for Vocational teachers in general than for rural Vocational Education teachers.	SA	A	?	D	SD
32. Only the non-college-bound need Vocational Education.	SA	A	?	D	SD
33. Academic courses are applicable to a wider spectrum of jobs than Vocational Education courses.	SA	A	?	D	SD
34. Most students would not benefit from the job skill instruction offered in Vocational Education programs.	SA	A	?	D	SD
35. Vocational Education courses are beneficial primarily for those who are terminating their education at the end of High School.	SA	A	?	D	SD
36. The Vocational Education curriculum provides a better preparation for more jobs than does the college preparatory curriculum.	SA	A	?	D	SD
37. Vocational Education courses provide learning experiences geared to individual needs better than academic courses.	SA	A	?	D	SD
38. Vocational Education programs help keep the potential dropout in school.	SA	A	?	D	SD
39. Vocational training is not as valuable to society as training for the professions.	SA	A	?	D	SD

APPENDIX E

INSTITUTE IX

FORM 3

NOTE: Please Do Not Sign Your Name

Key: SA (Strongly Agree), A (Agree), ? (Undecided), D (Disagree), SD (Strongly Disagree)

1. The objectives of this Institute were clear to me.	SA	A	?	D	SD
2. The objectives of this Institute were not realistic.	SA	A	?	D	SD
3. The participants accepted the purposes of this Institute.	SA	A	?	D	SD
4. The objectives of this Institute were not the same as my objectives.	SA	A	?	D	SD
5. I have not learned anything new.	SA	A	?	D	SD
6. The material presented seemed valuable to me.	SA	A	?	D	SD
7. I could have learned as much by reading a book.	SA	A	?	D	SD
8. Possible solutions to my problems were not considered.	SA	A	?	D	SD
9. The information presented was too elementary.	SA	A	?	D	SD
10. The speakers really knew their subject.	SA	A	?	D	SD
11. I was stimulated to think about the topics presented.	SA	A	?	D	SD
12. We worked together well as a group.	SA	A	?	D	SD
13. The group discussions were excellent.	SA	A	?	D	SD
14. There was little time for informal conversation.	SA	A	?	D	SD
15. I had no opportunity to express my ideas.	SA	A	?	D	SD
16. I really felt a part of this group.	SA	A	?	D	SD
17. My time was well spent.	SA	A	?	D	SD
18. The Institute met my expectations.	SA	S	?	D	SD
19. Too much time was devoted to trivial matters.	SA	A	?	D	SD
20. The information presented was too advanced.	SA	A	?	D	SD
21. The content was not readily applicable to the important problems in this area.	SA	A	?	D	SD

22. Theory was not related to practice. SA A ? D SD

23. The printed materials that were provided were very helpful. SA A ? D SD

24. The schedule should have been more flexible. SA A ? D SD

25. As a result of your participation in this Institute, do you plan to modify either your present or future work? YES_____ NO_____

If Yes, please describe the nature of the most important of such modifications and the activities which will be affected.

_____

_____

_____

26. As a result of your contacts with the participants and consultants at this Institute, have you decided to seek some continuing means of exchanging information with any of them, i.e., to establish some continuing relation with a participant(s) and/or consultant(s), for the purpose of information exchange?

YES_____ NO_____

If yes, what types of information can the consultant or participant contribute that would be helpful to your work?

_____

_____

_____

27. To what extent were the objectives of this Institute attained?_____

_____

_____

_____

28. In your opinion, what were the major strengths of this Institute?_____

_____

_____

_____

29. In your opinion, what were the major weaknesses of the Institute?_____

_____

_____

_____

30. If you were asked to conduct an Institute similar to this one, what would you do differently from what was done in this Institute?_____

_____

_____

_____

31. Additional comments about Institute._____

_____

_____

_____

_____

_____

_____

_____

32. If you had it to do over again would you apply for this Institute which you have just completed? YES_____ NO_____ UNCERTAIN_____

33. If an Institute such as this is held again would you recommend to others like you that they attend? YES_____ NO_____ UNCERTAIN_____

APPENDIX F

INSTITUTE IX

METROPOLITAN AREA APPLICATION OF VOCATIONAL EDUCATION
INNOVATIONS RESULTING FROM RESEARCH AND DEVELOPMENT PROGRAMS

POST-INSTITUTE EVALUATION INSTRUMENT

Dear Participant:

We solicit your cooperation in helping us to evaluate Institute No. IX entitled: "Metropolitan Area Application of Vocational Education Innovations Resulting From Research and Development Programs" which you attended September 14-18, 1970, in Albuquerque, New Mexico.

Please provide the following information about yourself and respond to the items on the following pages. Be assured that all responses will be summarized and used in the final report.

Kindly return this instrument to me as soon as possible.

Thank you for your help.

Sincerely,

Ivan E. Valentine
Institute Director
Department of Vocational Education
Colorado State University
Fort Collins, Colorado 80521

IEV/eaw

Present Date_____ Sex_____ Date of Birth_____

Name_____

City_____ State_____

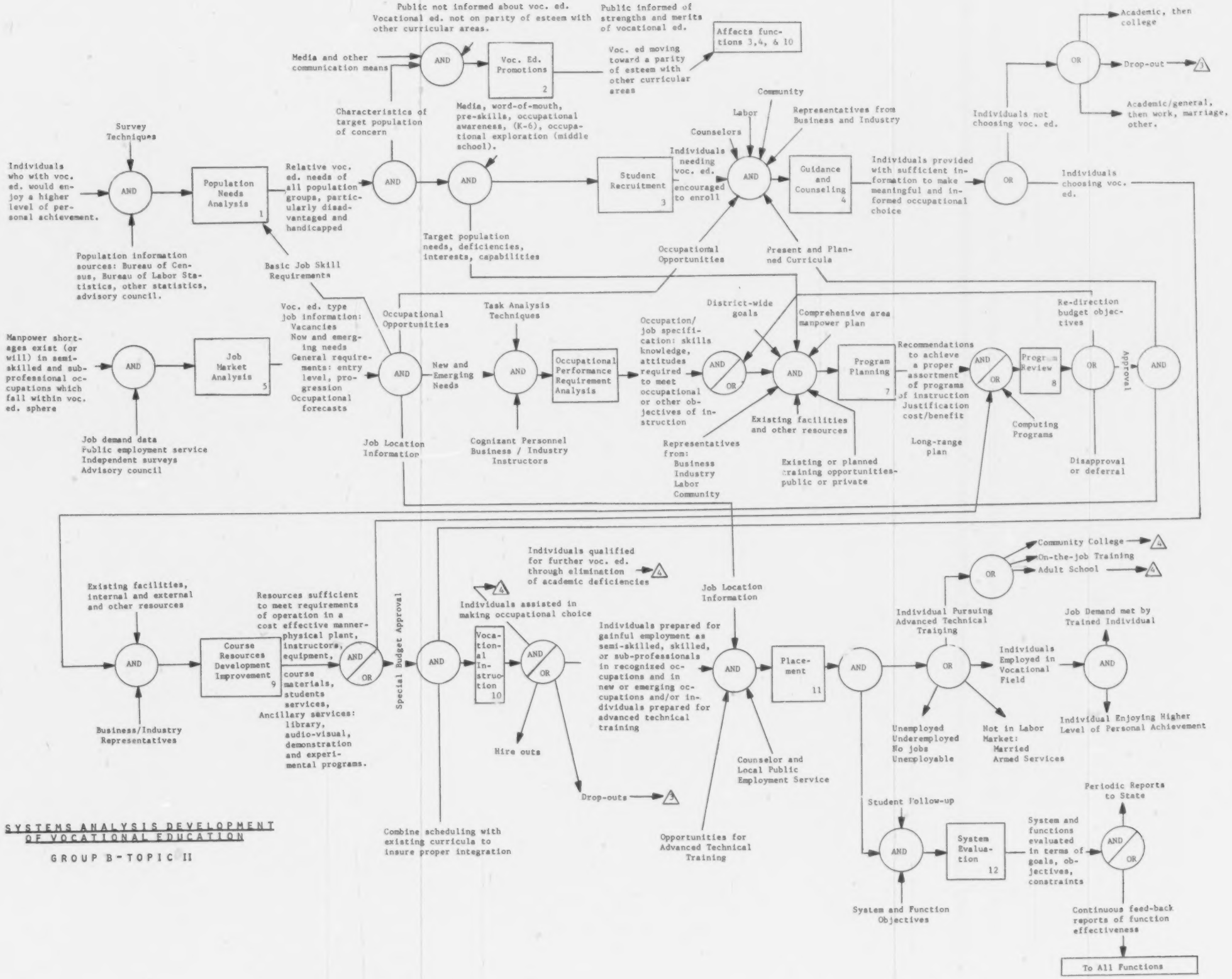
Position_____

Because of information gained at the institute, I: (Please check correct response):	YES	NO
1. Have re-evaluated present vocational programs.	___	___
2. Have made changes in present vocational programs.	___	___
3. Have explained new concepts to vocational teachers in the school district, institution, or state that I represent.	___	___
4. Have constructed new curricula.	___	___
5. Have helped others construct new curricula.	___	___
6. Have planned new instructional programs.	___	___
7. Have written courses of study.	___	___
8. Have written proposals for vocational programs.	___	___
9. Have written articles or other materials	___	___
10. Have initiated exemplary programs.	___	___
11. Have been working more closely with various segments of the community such as business, industry, and/or agriculture.	___	___
12. Have given talks on vocational education.	___	___
13. Have been working more effectively with other educators.	___	___
14. Have been constantly using some of the information presented at the institute.	___	___
15. Have definitely learned new concepts which have been valuable to me.	___	___
16. Have referred to and used the printed materials that were provided at the institute.	___	___
17. Have become more aware of the vocational needs of the disadvantaged.	___	___
18. Have developed specific programs for the needs of the disadvantaged.	___	___

	YES	NO
19. Have modified some of my present or planned activities in vocational education.	___	___
20. Have kept in contact with some of the participants and/or consultants I met during the institute.	___	___

In addition to the above, please describe those specific things that you have done as a direct result of having participated in the institute and briefly describe the changes in Vocational Education that resulted (use additional pages as needed):

APPENDIX G


Public not informed about voc. ed. Vocational ed. not on parity of esteem with other curricular areas.
Public informed of strengths and merits of vocational ed.
Affects functions 3,4, & 10
Media and other communication means
AND
Voc. Ed. Promotions 2
Voc. ed moving toward a parity of esteem with other curricular areas
Academic, then college
OR
Drop-out
Academic/general, then work, marriage, other.
Survey Techniques
Characteristics of target population of concern
Media, word-of-mouth, pre-skills, occupational awareness, (K-6), occupational exploration (middle school).
Community
Labor
Representatives from Business and Industry
Counselors
Individuals who with voc. ed. would enjoy a higher level of personal achievement.
Population Needs Analysis 1
Relative voc. ed. needs of all population groups, particularly disadvantaged and handicapped
Student Recruitment 3
Individuals needing voc. ed. encouraged to enroll
Guidance and Counseling 4
Individuals provided with sufficient information to make meaningful and informed occupational choice
Individuals not choosing voc. ed.
Individuals choosing voc. ed.
Population information sources: Bureau of Census, Bureau of Labor Statistics, other statistics, advisory council.
Basic Job Skill Requirements
Target population needs, deficiencies, interests, capabilities
Occupational Opportunities
Present and Planned Curricula
Manpower shortages exist (or will) in semi-skilled and sub-professional occupations which fall within voc. ed. sphere
Job Market Analysis 5
Job demand data
Public employment service
Independent surveys
Advisory council
Voc. ed. type job information:
Vacancies
Now and emerging needs
General requirements: entry level, progression
Occupational forecasts
Occupational Opportunities
Task Analysis Techniques
New and Emerging Needs
Occupational Performance Requirement Analysis
Job Location Information
Cognizant Personnel
Business / Industry
Instructors
Occupation/ job specification: skills knowledge, attitudes required to meet occupational or other objectives of instruction
District-wide goals
Comprehensive area manpower plan
Program Planning 7
Representatives from:
Business
Industry
Labor
Community
Existing facilities and other resources
Existing or planned training opportunities-public or private
Recommendations to achieve a proper assortment of programs of instruction
Justification cost/benefit
Long-range plan
Program Review 8
Computing Programs
Re-direction budget objectives
Disapproval or deferral
Approval
Existing facilities, internal and external and other resources
Business/Industry Representatives
Course Resources Development Improvement 9
Resources sufficient to meet requirements of operation in a cost effective manner-physical plant, instructors, equipment, course materials, students services,
Ancillary services: library, audio-visual, demonstration and experimental programs.
Special Budget Approval
Combine scheduling with existing curricula to insure proper integration
Individuals qualified for further voc. ed. through elimination of academic deficiencies
Individuals assisted in making occupational choice
Vocational Instruction 10
Hire outs
Drop-outs
Individuals prepared for gainful employment as semi-skilled, skilled, or sub-professionals in recognized occupations and in new or emerging occupations and/or individuals prepared for advanced technical training
Opportunities for Advanced Technical Training
Placement 11
Counselor and Local Public Employment Service
Community College
On-the-job Training
Adult School
Individual Pursuing Advanced Technical Training
Unemployed
Underemployed
No jobs
Unemployable
Not in Labor Market:
Married
Armed Services
Individuals Employed in Vocational Field
Job Demand met by Trained Individual
Individual Enjoying Higher Level of Personal Achievement
Student Follow-up
System Evaluation 12
System and Function Objectives
System and functions evaluated in terms of goals, objectives, constraints
Periodic Reports to State
Continuous feed-back reports of function effectiveness
To All Functions

SYSTEMS ANALYSIS DEVELOPMENT OF VOCATIONAL EDUCATION

GROUP B - TOPIC II

APPENDIX H

TABLE V

SUMMARY OF PARTICIPANT EVALUATION OF TOPIC--

AN ASSESSMENT OF PRESENT INFORMATION SYSTEMS

AND IMPLICATIONS FOR VOCATIONAL EDUCATION

Topic Evaluation - Monday

N=39

Items from Questionnaire Relative To Participant Opinion Concerning Assigned Topic for Discussion	Very Poor 1		2		3		4		Very Good 5		No Response		Mean Score
	No	%	No	%	No	%	No	%	No	%	No	%	
1. Content value of the prepared paper, sent to you in advance.	0	0	3	8	18	46	15	40	3	3	0	0	3.4615
2. Value of reactors contribution to the topic.													
a. Reactor no. 1	0	0	0	0	8	21	22	56	9	23	0	0	4.0256
b. Reactor no. 2	0	0	4	10	11	28	21	54	1	3	2	5	3.5135
3. How would you rate the value of the concepts (material) utilized or developed by your group relative to this topic?	2	5	2	5	18	46	17	44	0	0	0	0	3.2821
4. The ability of the discussion leader to hold and direct the groups activities for accomplishing the objectives of this topic.	2	5	4	10	15	38	14	36	3	8	1	3	3.3158
5. The value of this topic relative to its contribution to meeting the objectives of the Institute.	0	0	3	8	14	36	16	41	6	15	0	0	3.6410
6. How would you rate the contributions made by individuals of this group during the work session?	0	0	3	8	10	26	24	62	2	5	0	0	3.6410

TABLE VI

SUMMARY OF PARTICIPANT EVALUATION OF TOPIC--

SYSTEMS ANALYSIS AS AN INSTRUMENT FOR CHANGE IN URBAN

EDUCATION

Topic Evaluation - Tuesday

N=41

Items from Questionnaire Relative To Participant Opinion Concerning Assigned Topic for Discussion	Very Poor 1		2		3		4		Very Good 5		No Response		Mean Score
	No	%	No	%	No	%	No	%	No	%	No	%	
1. Content value of the prepared paper, sent to you in advance.	0	0	0	0	7	17	25	61	8	20	1	2	4.0250
2. Value of reactors contribution to the topic.													
a. Reactor no. 1	0	0	2	5	12	29	14	34	12	29	1	2	3.9000
b. Reactor no. 2	0	0	2	5	7	17	17	41	14	34	1	2	4.0750
3. How would you rate the value of the concepts (material) utilized or developed by your group relative to this topic?	0	0	3	7	18	44	15	37	5	12	0	0	3.5366
4. The ability of the discussion leader to hold and direct the groups activities for accomplishing the objectives of this topic.	0	0	8	20	13	32	15	37	4	10	1	2	3.3750
5. The value of this topic relative to its contribution to meeting the objectives of the Institute.	0	0	0	0	13	32	24	59	4	10	0	0	3.7805
6. How would you rate the contributions made by individuals of this group during the work session?	0	0	0	0	13	32	24	59	4	10	0	0	3.7805

TABLE VII

SUMMARY OF PARTICIPANT EVALUATION OF TOPICS--

LONG-RANGE PLANNING FOR VOCATIONAL EDUCATION

Topic Evaluation - Wednesday N= 37

Items from Questionnaire Relative To Participant Opinion Concerning Assigned Topic for Discussion	Very Poor 1		2		3		4		Very Good 5		No Response		Mean Score
	No	%	No	%	No	%	No	%	No	%	No	%	
1. Content value of the prepared paper, sent to you in advance.	0	0	6	16	10	27	18	49	3	8	0	0	3.4865
2. Value of reactors contribution to the topic.													
a. Reactor no. 1	0	0	2	5	14	38	13	35	8	22	0	0	3.7297
b. Reactor no. 2	0	0	0	0	1	3	2	5	2	5	32	86	4.2000
3. How would you rate the value of the concepts (material) utilized or developed by your group relative to this topic?	0	0	4	11	12	32	15	41	1	3	5	14	3.4063
4. The ability of the discussion leader to hold and direct the groups activities for accomplishing the objectives of this topic.	0	0	0	0	8	22	11	30	13	35	5	14	4.1563
5. The value of this topic relative to its contribution to meeting the objectives of the Institute.	0	0	3	8	9	24	17	46	7	19	1	3	3.7778
6. How would you rate the contributions made by individuals of this group during the work session?	0	0	0	0	12	32	15	41	6	16	4	11	3.8182

TABLE VIII

SUMMARY OF PARTICIPANT EVALUATION OF TOPIC--

AN OVERVIEW FOR THE APPLICATION

OF COMMUNITY RESOURCES RELATIVE

TO SPECIFIC EDUCATIONAL NEEDS

Topic Evaluation - Thursday

N=36

Items from Questionnaire Relative To Participant Opinion Concerning Assigned Topic for Discussion	Very Poor 1		2		3		4		Very Good 5		No Response		Mean Score
	No	%	No	%	No	%	No	%	No	%	No	%	
1. Content value of the prepared paper, sent to you in advance.	0	0	0	0	13	36	18	50	5	14	0	0	3.7778
2. Value of reactors contribution to the topic.	0	0	3	8	12	33	16	44	5	14	0	0	3.6389
a. Reactor no. 1 b. Reactor no. 2	0	0	2	6	8	22	15	42	2	6	9	25	3.6296
3. How would you rate the value of the concepts (material) utilized or developed by your group relative to this topic?	0	0	0	0	8	22	17	47	8	22	3	8	4.0000
4. The ability of the discussion leader to hold and direct the groups activities for accomplishing the objectives of this topic?	0	0	0	0	6	17	16	44	12	33	2	6	4.1765
5. The value of this topic relative to its contribution to meeting the objectives of the Institute.	0	0	1	3	5	14	17	47	11	31	2	6	4.1176
6. How would you rate the contributions made by individuals of this group during the work session?	0	0	0	0	8	22	15	42	11	31	2	6	4.0882

TABLE IX

SUMMARY OF PARTICIPANT EVALUATION OF TOPIC

USING THE DELPHI TECHNIQUE AND SIMULATION
EXERCISES IN IMPLEMENTING PLANNED PROGRAM CHANGE
IN VOCATIONAL EDUCATION

Topic Evaluation - Friday N=38

Items from Questionnaire Relative To Participant Opinion Concerning Assigned Topic for Discussion	Very Poor 1		2		3		4		Very Good 5		No Response		Mean Score
	No	%	No	%	No	%	No	%	No	%	No	%	
1. Content value of the prepared paper, sent to you in advance.	0	0	0	0	3	8	23	61	12	32	0	0	4.2368
2. Value of reactors contribution to the topic.													
a. Reactor no. 1	1	3	2	5	4	11	15	39	11	29	5	13	4.0000
b. Reactor no. 2	0	0	0	0	1	2	3	8	1	3	33	87	4.0000
3. How would you rate the value of the concepts (material) utilized or developed by your group relative to this topic?	1	3	0	0	4	11	9	24	2	5	22	58	3.6250
4. The ability of the discussion leader to hold and direct the groups activities for accomplishing the objectives of this topic?	0	0	0	0	4	11	10	26	2	5	22	58	3.8750
5. The value of this topic relative to its contribution to meeting the objectives of the Institute.	0	0	0	0	2	5	13	34	13	34	10	26	4.3929
6. How would you rate the contributions made by individuals of this group during the work session?	2	5	0	0	6	16	6	16	1	3	23	61	3.2667

APPENDIX I

TABLE X

ANALYSIS OF PARTICIPANT SELECTION FOR INSTITUTE IX

N=50

STATE	NUMBER	PERCENT	POSITION CLASSIFICATION OF PARTICIPANTS		
			SUPERINTENDENTS, ASSISTANT SUPERINTENDENTS, PROGRAM DIRECTORS, STATE DEPARTMENT PERSONNEL	RCU DIRECTORS, RESEARCH	CURRICULUM DEVELOPMENT OR COORDINATION
Arizona	1	2		1	
Arkansas	1	2		1	
California	3	6	2		1
Colorado	4	8	2		1
Hawaii	1	2	1		
Idaho	1	2	1		
Louisiana	3	6	2		1
Minnesota	2	4	1	1	
Missouri	3	6	2		1
Montana	1	2			1
Nebraska	2	4	1	1	
Nevada	1	2		1	
New Mexico	11	22	6	1	4
Oklahoma	2	4		1	1
Oregon	5	10	3		2
Texas	2	4		1	1
Utah	3	6	2		1
Washington	4	8	3	1	
18 States	50	100%	26	10	14